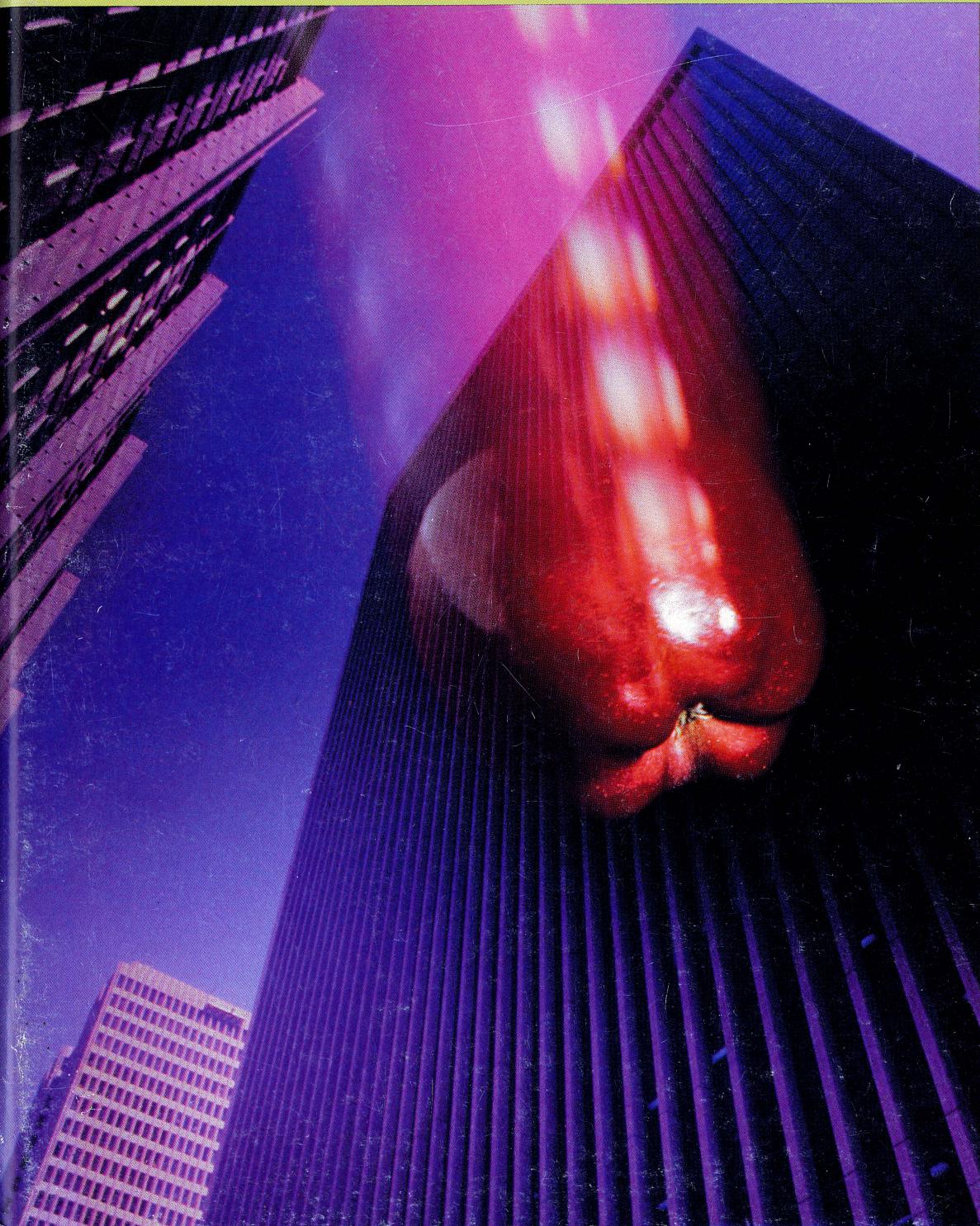


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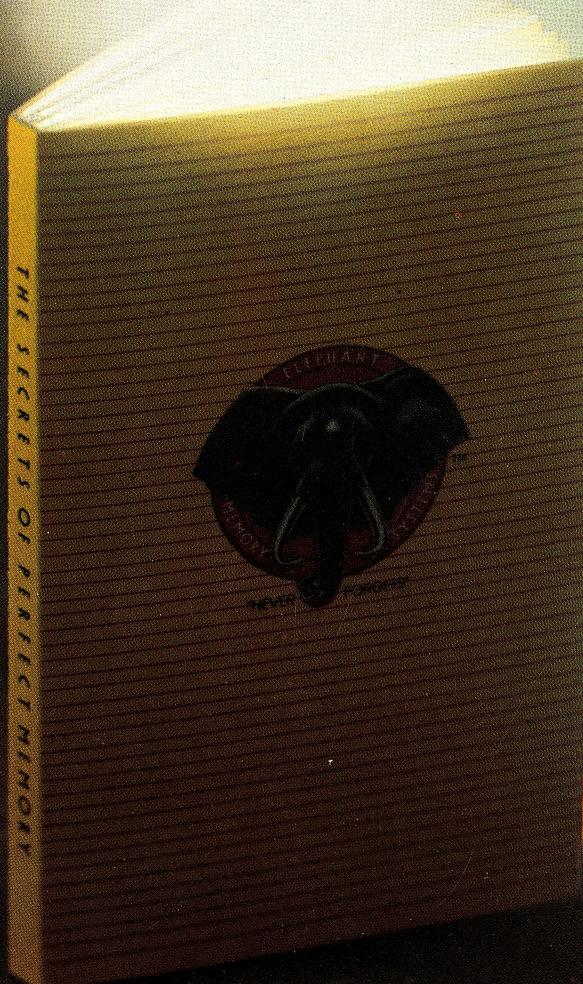
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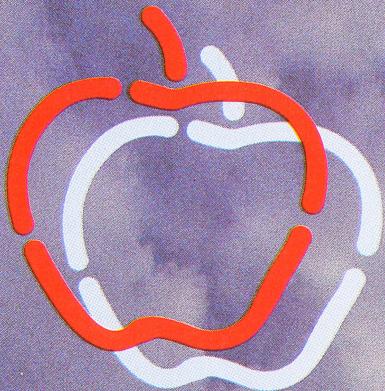
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# APPLE ORCHARD

Volume 4 Number 7 / October 1983

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## Take a Bite...



### Departments

Textfile	4
Ask Us/Tell Us	6
Peter C. Weiglin - Planting a Seed: The Badmouthers	15
Ken Silverman - From the IAC Office	16
IAC People	52
Listing Verification	86
IAC Sponsoring Members	90
The New Stuff Temptations, Delicacies and Necessities	93

“ *APPLE ORCHARD is an independent worldwide publication of the International Apple Core. Our existence is derived from the users of Apple and Apple-compatible computers, and it is their interests which we serve.* ”

# PC hardware

## Articles

---

**10** **A Look at the Future** - Don Norris  
Apple Software Developers Conference

---

**18** **One User Wonders What Happened to USER 1 on the //e** - Dan Fischer  
A missed signal.

---

**22** **Installing an Apple /// Driver** - Mike Kramer  
Software interfaces made easy.

---

**24** **Changing an Apple /// CP/M Driver** - Mike Kramer  
And while we're at it.

---

**30** **The Speediest Apple** - Neil D. Lipson, P.E.  
Combine the ingredients and stand back!

---

**36** **The Accelerator II** - Barry D. Bayer  
The board that leaves IBM's in the dust.

---

**38** **WPL: The Sleeping Giant, Part 1** - Richard Loggins  
The powerful language hidden inside your Apple Writer.

---

**44** **Data Management** - Malcolm Slovin  
First report from a new Special Interest Group.

---

**50** **Plot and Counterplot** - Peter C. Weiglin  
Two new plotters hit the market.

---

**54** **The Incredible Jack** - Barry D. Bayer  
And Master of None?

---

**58** **Personal Resource Projection** - Joe and Chris Jasper  
How much will you be worth?

---

**64** **IAC Disks of the Month** - Barry D. Bayer  
Education and Machine Language disks.

---

**68** **Everything but the Kitchen Sink** - Joyce Conklin  
A book to help teach BASIC.

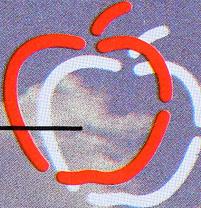
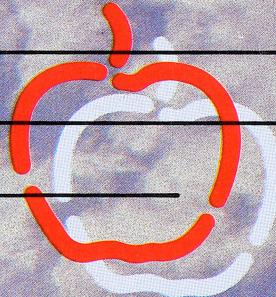
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**70** **The Documenter** - Woody Liswood  
The Computer-generated flow chart.

---

**74** **Use of the Disk Interface Card with Your Own Software** - John Uhley  
Part 3 - Spiral Protection Systems

---



*Coming Next Month . . .*

*Apples and the Law  
Direct Textfile Readout  
Language Comparisons  
Koalapad, Videoterm reviews*

# Apple Orchard

Vol. 4, No. 7

October 1983

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**Address** for all subscriptions, correspondence,  
advertising material, manuscripts, etc.:

**Apple Orchard**  
**908 George Street**  
**Santa Clara, CA 95050**  
**(408) 727 - 7652**

APPLE ORCHARD (ISSN 0277 - 1950) is published monthly by the International Apple Core, Inc., 908 George St., Santa Clara, CA 95050. Second Class Postage paid at Santa Clara, CA and additional entry points.

**Subscription Rates (U.S. funds):** \$24.00 for 1 year, \$45.00 for 2 years in the U.S., FPO & APO; \$30.00-1 yr., \$55.00-2 yr., in Canada; \$36.00 (surface), \$48.00 (airmail) in Mexico, Central America, Caribbean Islands, Philippines, Samoa; \$36.00 (surface), \$60.00 (airmail) in South America, Europe, North Africa; \$36.00 (surface), \$72.00 (airmail) in Asia, Middle East, South Africa, Australia.

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## Textfile

Yes, we look a bit different this month; we hope you recognized us. Apple Orchard is in the process of revising and improving its graphic layout. The next few months will bring even more changes. Rick Van Genderen has been working with us to make it happen against some "interesting" deadline problems caused by the magazine's growth in size and readership.

Another new item in this issue is the Direct Help Card, which is opposite Page 88. It is designed to do what its name implies: get help for you on a product advertised or included in our *The New Stuff* column. Circle your interest and mail in the card.

Our features this month include a search for speed. The intrepid Neil Lipson wondered what would happen if he used some of the products designed to speed up use of an Apple in combination. The amazing results appear on Page 30. We edited out his claim that his rig now can read files *before* writing to them.

For more details, the Accelerator board for the Apple II is checked out by Barry Bayer on Page 36. Note the IBM comparison with the II. Note also that the Apple // 's 6502 chip operates at almost twice the speed of the Apple II's, which makes the unadorned // much faster than the IBM. But nobody knows that.

We do know a little bit about Apple the Company's future, thanks to Don Norris' report on a recent Software Developers' Conference sponsored by Apple. Watch the secret mice scamper across Bruce Tognazzini.

Speaking of secrets, there's WPL, or Word Processing Language, which can be found hiding in every Apple Writer II, //e, or //. It is amazing how many people haven't tackled WPL yet, and thus only use a third of Apple Writer's capabilities. Well, here's the first article in a Richard Loggins tutorial series on WPL. It's a real eye-opener, because WPL greatly extends Apple Writer's capabilities to meet your unique word processing requirements.

For Apple // owners specifically, we have two articles this month on drivers, in native mode and in CP/M. For everybody, a personal resource projection program can help chart your future, while one of two new plotters could make the charts prettier. And more.

And, of course, there is The New Stuff, which is the most comprehensive new product listing and description you'll find anywhere. These items too are tied into the Help Card as an experiment. (Yes, we used to call that column something else, but let's face it, the old title just wasn't as descriptive. Besides, Weiglin the Editor thought it was time we backed off the Apple puns just a bit. The main thing is that you'll find the info.)

We look forward to hearing from you.



# Correction.

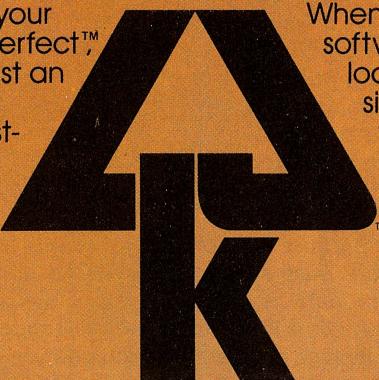


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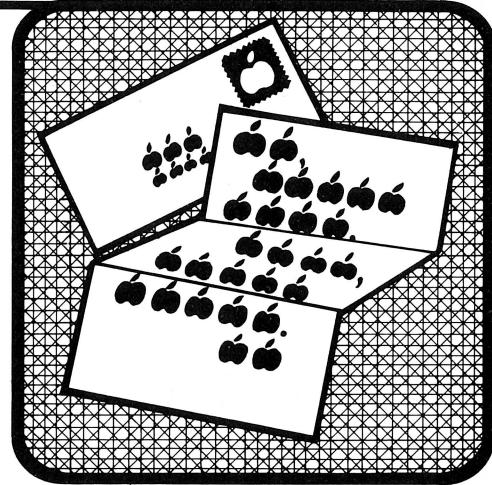
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# Ask Us/ Tell Us

Address your questions, answers, and comments to:

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We recently installed a small computer system in our (medical) office. Paperwork is down, but some of our patients seem less friendly toward us. How common is this? Can it be lessened? —T.G., Los Angeles

Once you have a computer system in your office or store you will notice a problem you probably did not anticipate. Your computer is getting in the way of secretary-patient or clerk-customer contact.

This relationship degenerates when the patient talks to your employee, who, at intervals takes time out to bang on the keyboard. The patient or customer is left watching the unattractive back of the computer terminal, a foreign, threatening experience at best. It may be practical for two staff members to handle this problem: one person talks to the patient keeping eye contact while the other enters data in to the computer.

Another technique is to avoid putting the computer between the patient and staff member. Position the terminal on the side of the desk/counter. This allows the patient to directly watch your staff and be watched in turn.

A third technique is to have a small monitor facing the patient or customer, and requesting that he or she check the data for accuracy as it is entered. Thus, the client participates. We'd be happy to hear about any other solutions. —Ellis J. Neiburger, D.D.S.

My activity at times requires me to send textfiles over a modem, usually on the Source. These files should have a carriage return at least every 80 characters, but my Apple Writer /// files don't have those returns because they're justified on printout. Is there any way I can put in those carriage returns without having to do it one at a time? —L.F., Anderson, IN

Yes, there is. While it's not highlighted as a feature, Apple Writer /// (and a number of other word processors) can be made to print to a Disk ASCII file instead of a printer, with the format, including carriage returns, inserted as for a printer. One hitch with Apple Writer: the target file name must already be present in the directory when you do this. So, first SAVE the file to disk under its "print" pathname (e.g., ".d2/PRINTLTR"). Must be different from the storage name). Now use CTRL-P, set the print parameters (LM 0, RM 75, etc.) and replace the print destination (PD) ".PRINTER" with the "print" file pathname. At that point, you're "modifying" the "print" file.

Clear memory and Load the "print" file. If you make the carriage returns visible (CTRL-Q;6) you'll see the formatted document. That's sometimes helpful as a preview too. When transmission time comes, send the "print" file. —P.C. Weiglin

We got a computer system that was touted to do everything. It falls short of our expectations. Shall we junk it? How do we go back to manual simplicity? —F.K., Chicago

First, consider that just because you have been using a full system, you must de-computerize completely, even though your frustrations impel you in that direction. Better to take a few steps back. Instead of doing all your office functions via computer, do only a few... like client mailing lists or word processing, appointments, etc. There is no rule that requires you to use the computer for every function. Just sit back and get a simple program or two and use it. Perhaps sometime in the future there will appear a full office program that you can use and enjoy... but until then, you can still benefit from computerization.

What happens when your system works perfectly but the hardware has glitches that render life unpleasant? Cut out the defective unit, wind down and sit back until a functioning improvement or replacement is made... then get it and start up.

The important key is that computerization is for your benefit and when it ceases to work well... change. You are not committed to use your system all the time and times do change. If it pays to stop computerizing for a while, do so. You will be able to pick things up a little later on. —Ellis J. Neiburger.

## BASIC Compare ///

BASIC Compare /// is a program which will permit you to compare two Apple /// Business BASIC programs (preferably two versions of the same program) and print the differences on a printer, display on a console, or send to disk. If you do much programming, you will soon find out how useful this can be, especially if you follow the good programming practice of not overwriting the old version of a program with the new.

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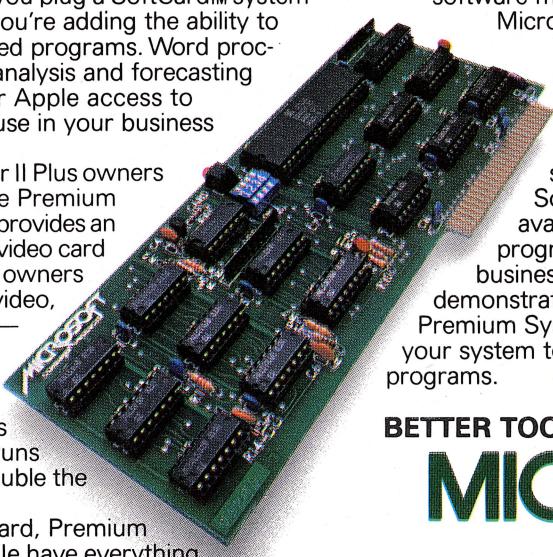
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# A Look at the Future . . .

## Apple's Independent Software Developer's Conference

by *Don Norris*

**T**wice a year, Apple Computer puts on a very extensive and thorough series of workshops and seminars for independent software developers. The quality of the information presented by Apple at these four-day workshops makes it very obvious that Apple is committed to supporting and working with the independent software developer. The goal is a broader range of better products for all of us.

The most recent of these conferences took place between August 8 and August 11. System Failure \$06 is in the Apple /// a stack overflow, which is exactly how I felt after attending the sessions. How do you handle a 2 to 3 inch high (paper) stack of information from a four day conference; a stack which could have been even higher if I had picked up *everything* available and been able to attend every workshop.

John Sculley, Apple's new Chief Executive Officer, sounded the general theme. His comments in general: Apple's market positioning is to be the best, not the biggest. Apple would be marketing on a performance basis and not on price. The latter strategy has been pursued by a couple of other computer companies with some disastrous financial results.

### Technical

The conference began Monday afternoon with informal sessions on various topics. Of particular interest to me was the session on integrated software, which has become one of the microcomputer industry's buzz words in recent months. (Various manufacturers are claiming that their approximation of Lisa's integrated approach is "imminent". Sure it is.)

This brought up the question of just what is meant by integrated software. Is it having several functions built into one piece of software, such as a spread sheet, database, and text editing all in one package or the ability to move data from within one program to a different program? The developers present indicated that there was no uniform standard in the industry for data transfer. (*Not for much of anything else.*—PCW)

The only thing close to a standard means of file transfer and format is an ASCII text file. Everyone generally agreed that while it was not perfect it represented a starting point.

New tools are being developed to make software authors' jobs easier. An example is a new language called Classcal, which has evolved as a result of the Lisa technology. It is a marriage of Simula and/or Smalltalk (plus some other language) and Pascal, and is designed to support object-oriented programming.

Improvements have also been made to existing languages, particularly Pascal. Because these languages are loaded into memory rather than being resident in ROM as they are in some machines, they are easier to upgrade and debug. This gives greater latitude to the programmer; you do not have to make a hardware change when a bug has been cured or an improvement (enhancement) is made to the language.

On the question of Rodents on the //e: Evidently rodent (mouse and beyond) technology is being developed for the Apple II-/// product family. This led to an interesting situation later in the morning when several developers started asking

specific questions about the device of Bruce Tognazzini, who was trying valiantly to maintain data security about the new concept. Bruce was unaware that El Presidente had let the mouse out of the bag, so to speak.

### Marketing

The most startling news was in the area of market penetration: only 7% of the potential market for personal computers has been penetrated.

As to whether the Apple //e or /// had been eclipsed by other machines, the answer from John Sculley was that we have not seen the last model of the Apple // or ///. There will be continuing product improvements, not phaseouts, in the product family which includes the // and the ///. You will see more and faster products in this family in the future.

Particular attention was paid to the Apple ///, in light of industry rumors about the machine's future. A special team has been put together to address the marketing needs of the ///. Apple Vice President Ken Zerbe said the /// had been suffering because it was always under the direction of people with other commitments or people yet to be hired (called "TBH" in Apple land), or was assigned to a department which also had several other responsibilities. Consequently, the /// got lost in the shuffle. Many Apple /// owners had expressed the feeling that they were orphans, and now we know why. We were orphans. That should change.

Future product enhancements will greatly enhance the portability of data and software within the //e and /// product family.



## Demonstrations

Wednesday afternoon, various software and hardware vendors and developers demonstrated new products they were going to unveil or already had on the market. Most of these can't be revealed here, but of note to Apple /// owners were high density 5-1/4 inch floppy disk drives from Rana with 652K Bytes and Micro-Sci with 572K Bytes. Both of these drives can be daisy chained onto the ///.

Tim Gill of Quark, Inc. demonstrated Version 2.0 of Catalyst. This new version is much easier to install and to use. It features an inverse cursor over a menu item. The user can then scroll to the program he wants to use, and merely press «RETURN» to run the desired program. Previously to use Catalyst you had to add every driver you might need for any program onto the Catalyst Boot Diskette SOS.Driver file. This meant that when using VisiCalc, the RS-232 driver and any graphics drivers would have to be on the boot diskette and loaded into memory even though they would not be needed by the program. Another addition to the Catalyst Menu is the ability to exit to Lobotomy (Apple II Emulation)

Mode and turn your 256 K Apple /// into 48K Apple II without rebooting.

One question asked of a software developer was, "Why aren't you developing software for the 'other horse' (presumably Baby Blue) as well?". The reply was that Blue provided no developer support, saying only, "Here is the gray box, you write your software for it".

Another developer criticized Apple's low disk storage capacity, saying that he was working with IBM because, "I will not put on the market software for an Apple which requires multiple disks when I can market for the other machines on one diskette, thus making it much easier for the ultimate user."

Regarding the ultimate end user and disk storage, this was stated to be an item of great priority within Apple now since Unifile and Duofile have been laid to rest. They required too much power, and were too expensive to manufacture. All types of mass storage media are being investigated; Apple does not appear to be sleeping.

## Lisa

Thursday was Lisa day. Lisa is the first in a family of personal computers to be

released by Apple based on the 68000 CPU. Developers are being encouraged to write software for Lisa and to take advantage of its powerful integrated software and ease of use for the end user. In this way the developer would have a head start on working with the new machines as they are introduced.

A prime example of the kind of software that has yet to be developed for Lisa is a spelling checker. Most of the material that was handed out at the conference was prepared using LisaIt contained several spelling errors. It was one more reminder that the imperfect human remains in control, but the tools continue to improve.

An overriding theme of the conference was for developers to "leverage" their efforts with Apple by taking advantage of the research and development Apple has done regarding improved user interface and enhancements to programming languages. Ease of use is an important part of Apple's marketing thrust and was stressed repeatedly during several of the workshops at the conference. The Apple folks stressed their commitment to independent developers as being necessary to Apple's success.



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**64K RAM BOARD** 64K of dynamic RAM with provision for control to be used in the normal Apple ][ conventions; deleting COOO-CFFF and software control over the DOOO-FFFF area.

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**UART BOARD** Software/hardware select all standard EIA baud rates. The board supports four 6850 UART's which allow four independent input and output EIA lines. Each UART is fully programmable for parity, bit length, baud rate, etc.

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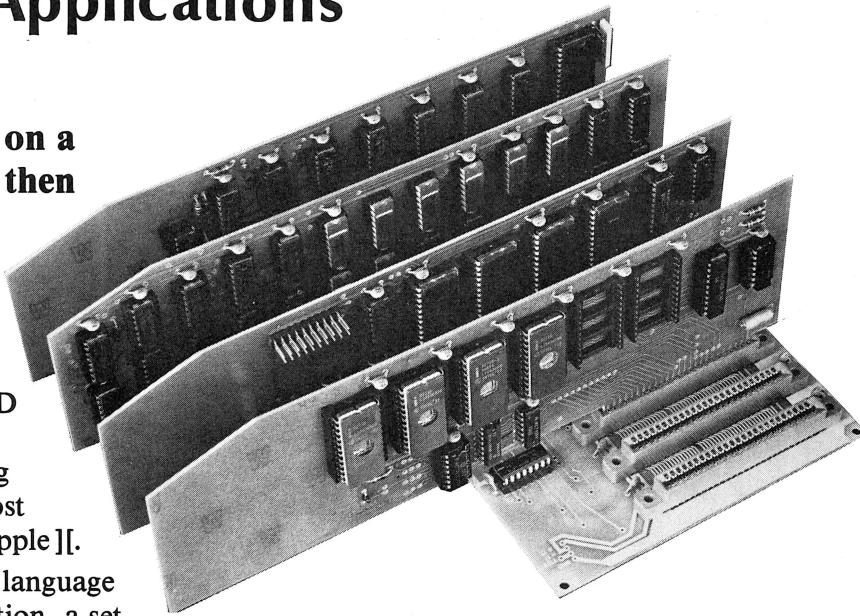
**TEXT BOARD** The TEXT board is designed to add the conventional TEXT (page 1 and page 2) to an APPLESEED system. The board generates composite video to plug into a standard monitor or T.V. modulator. The board provides 40 columns x 24 rows in each page and is not slot dependent.

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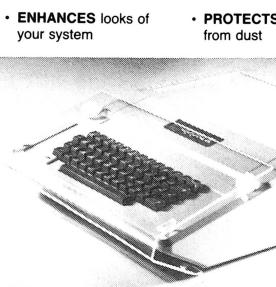
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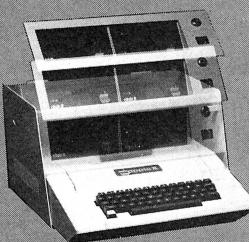
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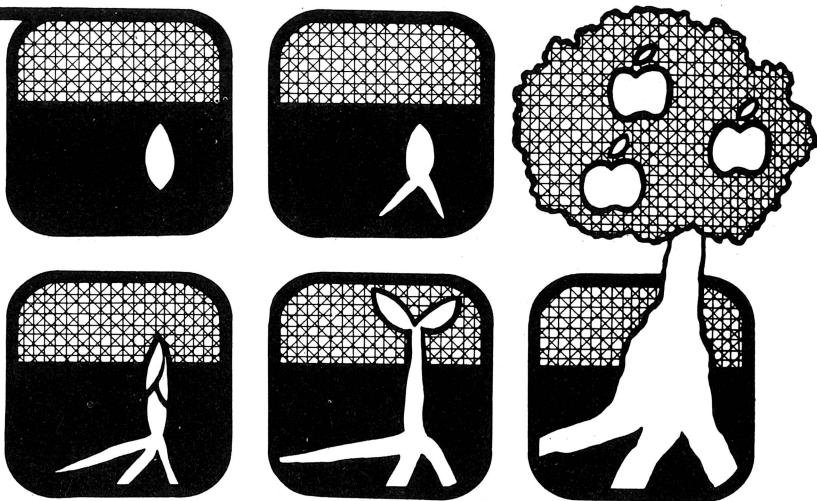
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# Planting a seed...



## The Badmouthers

"Tell me; When is Apple gonna do anything right???"

We keep hearing it (1) The Apple /// is a total disaster. (2) Lisa is a computer for which there is no real market; (who needs a \$10,000 work station?). (3) Macintosh will be eclipsed by the time it comes out. And (4) the Apple //e should have happened a year sooner. (5) Unifile and Duofile are trash. (6) Apple rejected VisiCalc. (7) Applewriter, Quickfile, and other Apple software products are not the products of choice in their areas. Garbage, compared to what's available on CP/M or the IBM PC. (8) And there's no new software for the Apple. "Everybody" in software development is developing for the PC first.

(9) Steve Jobs is a megalomaniac, a lightweight who got lucky. The good news is that (10) with him "playing" in Macintoshland he's out of the way and the grownups can run the company. (11) John ("The Fizz") Sculley was hired because "Camp Runamuck" was in trouble. (12) What can you say about a company where the artistic design group controls product marketing strategy? Or (13) where the decision process makes the most-asked question "How come I didn't know about this, when it's supposed to be my responsibility?" (15) "Apple people are devoted all right; haven't seen such dedication to a common purpose since Jonestown."

(15) Apple doesn't support its dealers. (16) Apple doesn't screen its dealers, or train them. (17) Look at the large store chain that told Apple to visit a good taxidermist. (18) Apple doesn't support its customers, either; there used to be a hotline, but that stopped. They (19) killed mail-order to fatten profits. And service (20) ranges from nonexistent to just bad. In short, (21) Apple is a company that has already seen its best days.

That's just a sample; the computer press is full of this kind of incendiary editorial driftwood, just as other segments of the

press, radio, and TV are in hot pursuit of circulation through sensation and the broadcast of colorful negative innuendo and opinion. Well, sensation and attack may sell papers, but they don't satisfy the need for solid and helpful information.

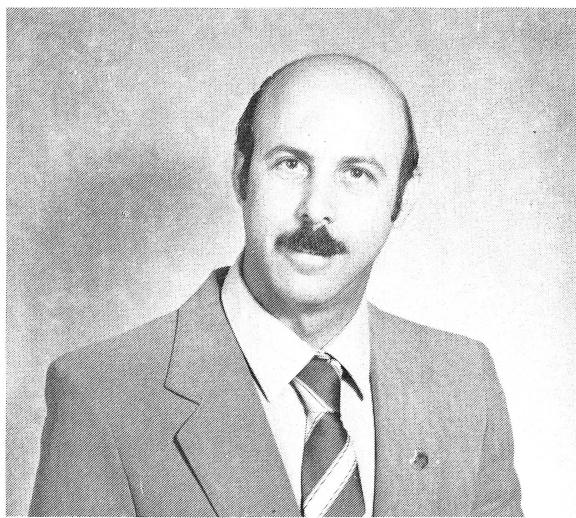
Here's the reason why **Apple Orchard** has existed without an "industry gossip" column: we have felt that most of the people who own Apple computers don't know about the politics of Apple, and care even less. The magazine's primary function is to help people do more with their computers; the Silicon Valley Soap Opera doesn't really contribute to that goal. We devote the space to new product coverage, which does help you.

As to the good and bad decisions, sure, we'll call 'em the way we see 'em; our loyalty as an independent publication is to you, the Apple user. But our responsibility is to present what facts there are, good or bad for a commercial interest, *when the facts and context can be verified, and when it helps you*. Frankly, we don't think you're well-served by the magpie cries of the gossipy sensationalists as they seek to feather their own nests.

One more thing: if even a significant part of the bilge water referenced above were either true or relevant, would Apple ever have attained Fortune 500 size in five years?

# From the IAC Office...

Ken Silverman, Executive Director



There still seems to be a gross misconception about user groups and software piracy. A number of software vendors, authors, and retail stores perceive that most user groups are nothing more than a place where commercial software is copied. This perception is totally false.

User Groups demonstrate commercial software, write reviews, and comment on the pros and cons. They are a resource center

for prospective buyers, a place where you can get an honest answer from people who are using or have tried a specific program. This also applies to hardware; "what should I purchase in a printer" is a good example. A User Group is formed to help, educate, and inform - software copying is not part of that.

The IAC, since its inception in 1979, has stood against the copying of any commercial/copyrighted software. It is even one of the two conditions under which a member user group can be terminated from the IAC. In the past 4 years, we have issued warnings, which were complied with. The IAC has not had to terminate a group for this offense - that's quite a record for a user group membership of over 450.

This entire subject is regrettable and in the long run takes its toll in the form of higher prices and "protected", harder to copy, software for everyone. Manufacturers generally accept that copying is inevitable, and accordingly market their products at a higher price to recoup their costs before they lose money to copies.

The so-called "copy protected disk" can be copied by someone with sufficient skill and expertise. But for the most part, this added difficulty reduces the number of copies that could be made. The "copy protected" program can be a burden on the legitimate purchaser in the form of delays, when a replacement is needed, and in some cases, of additional charges, when trying to obtain a backup.

There have been many forums presented on this subject at computer shows. Many plans have been proposed to prevent copying while supplying the purchaser with ways or means of a backup so he always has access to his software. Each author or manufacturer has their own scheme. Again, this is regrettable, but it is something brought upon ourselves by knowingly accepting and using, from whatever sources, bootlegged programs.

## Available from the IAC:

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from Apple Computer, Inc.

Converts Applesoft programs to

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DOS to SOS Converter .....	10.00
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CP/M → SOS Text Mover .....	25.00
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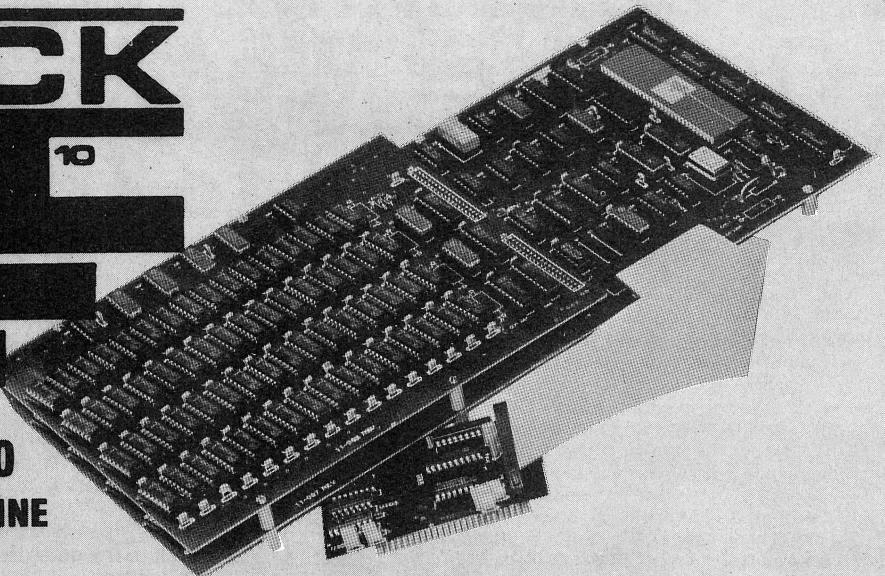
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# DTACK

10

## The 68000 DREAM MACHINE



### THE DTACK GRANDE:

Above is a photograph of the prototype for the DRAM version of our Apple compatible 68000 board. We have modestly named it the DTACK Grande because it has a **Grand(e)** amount of memory: a megabyte! That's called a *full gallon* here in California. (You can buy one with only 128K if you like.) This one has a 25MHz Xtal oscillator which we divide by two to generate the 12.5MHz clock for the 68000. DTACK is **not** grounded; there is one wait state. Refresh is performed in software, with a hardware assist so that the overhead is exactly the same for a megabyte as for 128K (4%). Thus the effective speed of this board is equivalent to 10MHz with no wait states.

Which makes our one megabyte 68000 exactly twice as fast as **another** one megabyte 68000 system that you Apple types may have heard of. The other one doesn't work with Apple II's, of course. Ours does.

Because the refresh is interrupt-driven, this board is inherently capable of multi-tasking so all you print spooler and type-ahead buffer fans should *love* this board. We think it will make a **dandy** RAMDISK. Oh, yes: it has a big, fast 68000 microprocessor (we almost forgot while we were admiring all that memory!).

### TRUTH IN ADVERTISING:

Many of you have seen that ad with the tricycle falling apart which asserts that the iAPX 286 is faster than the 68000. Here are the facts:

- 1) The board pictured above, with one wait state, can perform a 32 bit add in **less than half a microsecond** and an 8MHz 286 **can't**.
- 2) Intel is currently running ads offering 6MHz 286 boards, projecting delivery of 7.7MHz boards early next year. **What 8MHz 286?**
- 3) The 68000 has exactly seventeen more 32-bit registers than the 286. That's because the 286 doesn't have any.
- 4) Back to that tricycle ad: have you noticed the fine print that says the speed of the 68000 has been "**adjusted**"?
- 5) AMD and Intel like to compare against a slow 8MHz 68000, burdened down with a memory management chip for **multi-user** systems. We are offering 12.5MHz 68000s for **single-user** applications. **BIG** difference!

- 6) The 68000 can **linearly** and **directly** address up to 16 megabytes of RAM. The 286 **can't**. That's important when you have a megabyte of RAM!

However, since we believe in 'truth in advertising' ourselves, that prototype pictured above doesn't work yet. We have not yet programmed the PAL memory decode chips or the bootstrap PROMs. This ad is being written on 23 May '83, so things may have changed by the time you read this.

### THE 'STUFFER' BOARD:

In our last ad we told you about a 'block DMA' interface we were developing. The production boards just walked in the door and we will be shipping that interface this month. It works with both the static and the dynamic RAM 68000 boards we make. (However, it was designed before the Apple IIe was available, so it is **not** compatible with the IIe.)

### SOFTWARE:

All the stuff we mentioned in our previous ads is still available. We are well along the road developing HALGOL, a high speed BASIC-like language that runs at close to 68000 assembly language speeds - and that is **very fast**! Right now we are finishing up the BIOS. That stands for Basic I/O System. It turns the 6502 in the Apple into an I/O handler exclusively, and lets the 68000 take over and run things.

### SHOULD YOU BUY OUR BOARD?

Our board is still not suitable for persons who just want to turn on their computer and run canned software. You **must** have some interest in doing some programming yourself, or you will not want to buy one of our boards.

We still provide **lots** of 68000 source code on unlocked, easily copyable disks. Three disks with demo programs and source code are shipped with each board.

Aside from that, we can only think of a **million reasons** why you might like to buy one of the boards pictured above.

**DIGITAL ACOUSTICS**  
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# One User Wonders What Happened to USER 1 on the //e

by Dan Fischer

Hidden away on the old Apple II motherboard was a pair of solder pads affectionately referred to as "the USER 1 Jumper." They were not flagged on the silk screen but they were pictured in the Apple II Reference Manual (Page 99, if you doubt me).

"If you connect a wire between these two pads, then the USER 1 line on each peripheral connector becomes active. If any peripheral card pulls this line low, ALL internal I/O decoding is disabled. The I/O SELECT\* and the DEVICE SELECT\* lines all go high and will remain high while USER 1 is low, regardless of the address on the address bus."

The USER 1 line was connected to pin 39 of each of the I/O slots if you installed the jumper. (I don't know of anyone who did.) The other end of the line was held high by a pullup resistor. It served as a chip enable for the 74LS138 at chip location H12 (pin 6). (Chip locations are referenced by a combination of letter and number, just like the grid squares on a road map.) Although I know of no one who installed this jumper, I do know of two card manufacturers who use USER 1.

The Mountain Computer CPS Multifunction Card includes a jumper that runs from the card to a little socket that snuggles under the 74LS138 at H12. The jumper accesses the USER 1 line without benefit of Apple's "USER 1 jumper." By pulling this line low the CPS card can "phantom" its functions over other cards.

The other card that uses USER 1 is Prometheus Products' Versacard. The card also phantom functions over slots where it does not reside. But the Prometheus card doesn't do it by pulling USER 1 low. The VERSACARD presumes a user is smart enough not to try to put two incompatible functions in the same slot. VERSACARD generates its own I/O SELECT\* and DEVICE SELECT\* for the slots where it is phantomed. And it recognizes the function of USER 1 and responds to it. If USER 1 goes low the VERSACARD does not generate its I/O SELECT\* and DEVICE SELECT\* signals.

So along comes the Apple //e. It needs to improve on the Apple II. (Hey, what's progress for, if not improvement?) There was only one pin on the Apple II bus that wasn't used and Apple wanted to add two more signals. One of the new signals is ENKBD\*. It is normally low and enables the normal keyboard. A peripheral board may lockout the keyboard by pulling this signal high. The other new signal is UPSYNC which is high during operation code fetch. It is a signal directly derived from the 6502. Used in conjunction with RDY a board could single step the 6502. Unfortunately, however, UPSYNC replaces the old USER 1.

Well there goes the old compatibility. USER 1 just doesn't exist in the //e. The VERSACARD is in trouble because it disappears every op code fetch. (Easy fix, just cut the trace to pin 39.) But it may not be so easy for the CPS card. (Or maybe it's easier.) There being no USER 1 line any more, the CPS card could just ignore it, not attempt to disable I/O decoding. It just might work, . . . BUT!

Have you noticed that there are two 8K ROMS in the //e where there used to be six 2K ROMs in the Apple II? In the Apple II, the resident BASIC and the MONITOR occupied the addresses from \$D000 to \$FFFF, 12K of addresses, (6 \* 2K = 12K). Have you wondered about what the extra 4K might be used for in the Apple //e? Have you wondered how to address it? Well so have I, but that is beyond the scope of this article.

Suffice it to say that some of the extra 4K of ROM is phantomed over the I/O SELECT\* areas. Any board that directly decodes these addresses may get into serious trouble when the MONITOR uses them. It is no longer so simple as to just decode the addresses.

"SON OF USER 1" to the rescue! Remember pin 6 on the 74LS138 at H12? You know, USER 1. Well, it's been replaced by a new signal called CXXX. CXXX is generated by the //e's Memory Management Unit (MMU). It is high whenever the address bus is addressing addresses between \$C000 and

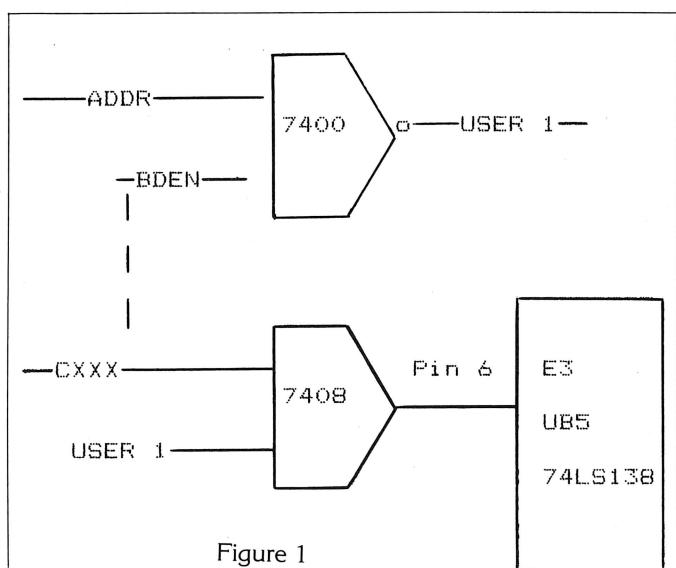
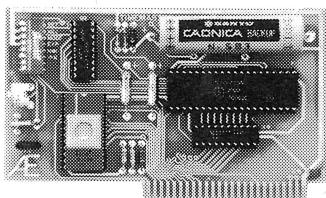


Figure 1

# APPLIED ENGINEERING

## THE BEST PERIPHERALS FOR THE BEST COMPUTER

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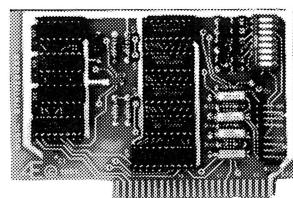
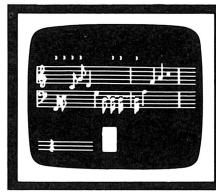
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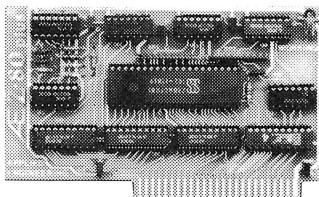
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VIEWMASTER	169	YES	YES	YES	YES	YES	YES	YES
SUPERTERM	375	NO	YES	NO	NO	NO	YES	YES
WIZARD80	245	NO	NO	YES	YES	NO	YES	YES
VISION80	375	YES	YES	YES	YES	NO	NO	NO
OMNIVISION	295	NO	YES	NO	NO	NO	YES	YES
VIEWMAX80	219	YES	YES	YES	YES	NO	NO	YES
SMARTERM	360	YES	YES	YES	NO	NO	YES	NO
VIDEOTERM	345	NO	NO	NO	YES	YES	NO	YES

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- Compatible with all Apple IIe 80 column and extended 80 column card software (Same physical size as Apple's 64K card)
- Available in 64K and 128K configurations
- Bank select LED's for each 64K bank
- Permits your IIe to use the new double high resolution graphics
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\$FFFF AND when the MONITOR's CX Space is off. This signal allows I/O decoding just as USER 1 inhibited it. The //e has a 74LS138 located at B5. It functions almost identically to the 74LS138 (the "138" to its friends) on the II Plus.

Cards like the VERSACARD which used to read USER 1 can use a jumper to B5 pin 6 to read CXXX. Cards like the CPS card which used to pull USER 1 low have a slightly harder time of it. They must put some logic between CXXX and the 138 that will disable their own address decoding and pull pin 6 of the 138 low when CXXX goes low. Their logic must not attempt to pull CXXX low when they wish to inhibit I/O decoding.

As long as the 74LS138 at B5 is socketed it won't be too hard to add a small circuit, such as the one pictured in Figure 1 to mimic the functions of USER 1. May the FORCE be with us if Apple ever decides to eliminate the socket under the 138.

To implement the above circuit, the 74LS138 at B5 would have to be removed and inserted in a small circuit that would break the CXXX line and provide a jumper to the peripheral board needing the functions of USER 1. The new board would contain the 7400 and the 7408 chips diagrammed in Figure 1. CXXX high and a high from the board's address decoding would pull low the USER 1 signal. This could be used by the board to enable its chips and outputs. It would be ANDed with CXXX and fed back thru the jumper to disable Apple //e on-board I/O decoding. Using this circuit I/O decoding would be inhibited either when CXXX went low or when CXXX was high and the peripheral board had decoded an address in its area.

It sure is nice to know that some problems remain to be solved, isn't it?

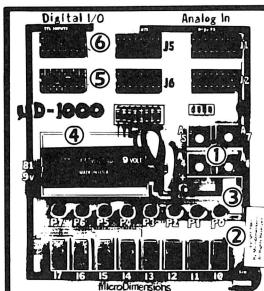
*Mountain Computer says that they have a jumper with circuitry for \$5.00 that allows the CPS card to function in the Apple //e.*



## Input/Output Made Easy!

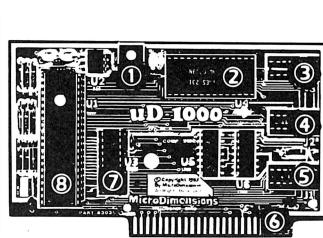
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- 4 8 Digital Inputs
- 5 8 Buffered Digital Outputs
- 6 Gold Plated Connector Plugs into Your Apple
- 7 Digital Buffer
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# Installing an Apple /// Driver or What Have I Gotten Myself Into?

by *Mike Kramer*

*Houston Area Apple Users Group*

## THE INITIAL SHOCK

When my office Apple /// arrived a little over a year ago, everyone was anxious to see what it could do. This naturally included seeing it *print* something. After impressing everyone with being able to enter a simple VisiCalc spreadsheet without reading the manual, I lost all credibility when it wouldn't print anything on the Epson printer. After they left, I got out the owner's manual and discovered that Apple /// software normally comes configured for serial printers connected to the built-in serial port. For me to print on the Epson printer connected to the Universal Parallel Interface Card (commonly called a UPIIC) in Slot 1, I needed to install and configure a parallel driver. What's more, I needed to do this with every boot disk I had or would ever have, that would use the parallel card.

What I didn't realize at that point was that the source of my "difficulty" was in fact one of the outstanding features of the Apple ///. That feature is Apple ///'s ability to execute programs written with little regard to what kind of output device would be used (also known as *device-independent I/O*). Without the programmer knowing ahead of time where program output will go, output from Apple /// programs can be directed to a printer, the screen, a named disk file, etc., at run time.

The price we pay is having to generate appropriately configured drivers into any new software we get. Not much of a price when you know how, and you should know how to install drivers if you intend to use an Apple ///. This is particularly so since generating drivers for the Apple /// is not something the typical store person knows very much about (there are exceptions, however). So after this rambling introduction, get out your Standard Device Drivers Manual and, if you have one, the UPIIC Parallel Interface Installation and Operating Manual, and let's find out how to do it.

## What is a Driver?

First, let's review what a driver does. The Standard Device Drivers Manual describes peripheral devices such as the keyboard, video display, speaker, and input/output (I/O) ports as the "senses" of the computer, i.e., the eyes, ears, etc. These senses are connected to the Sophisticated Operating System (SOS) by device drivers which perform four functions:

- Process data generated by programs and send it to the devices as output.
- Process data generated by the device and send it to programs as input.
- Permit programs and SOS to control the device and the driver itself.

- Permit programs and SOS to read the status of the device and the driver.

Most of you don't need to be concerned with the specifics of what the drivers do, but it should help your understanding if you're generally aware of what they do and why they are there.

## System Configuration Program

One of the disks provided with the Apple /// is the System Utilities Disk, which includes the System Configuration Program (SCP). This is the tool for adding or removing device drivers, or changing the parameters that control their operation. You may have noticed when cataloging disks that every bootable disk has three special files named SOS.KERNEL, SOS.DRIVER, and SOS.INTERP. SOS.KERNEL is SOS itself. SOS.INTERP is the machine language "interpreter" which runs on bootup. This can be Business BASIC, Pascal, Apple Writer ///, VisiCalc, etc. Unless you become very, very good with the Apple /// you will never create your own SOS.INTERP.

SOS.DRIVER contains the system configuration, including the drivers and their control parameters, the number of disk drives connected, the video display character set, the ASCII character codes assigned to each key on the keyboard, and the slot assignments for any interface cards plugged into the connectors inside the Apple.

## Reading a Driver File

First, let's find out which drivers are in fact currently on a boot disk. Place your System Utilities diskette in the built-in drive and boot it. Next, run the SCP by moving the cursor to the third line and pressing RETURN. To look at and possibly change any of the information defining how your Apple /// operates, tell the SCP to READ in the SOS.DRIVER file from the diskette of interest by placing the cursor over "Read a Driver File" and pressing RETURN.

Why not read in the SOS.DRIVER file from the Utilities diskette itself and configure it (you are using a backup copy of the original disk, aren't you?), so that you can list directories on your printer rather than always listing on the screen. The SCP defaults to .D1/SOS.DRIVER, so all you have to do is press RETURN. To read from a disk in the external drive, change .D1 to .D2 before pressing RETURN.

After a few seconds, the current driver configuration will be displayed on the screen as shown on Page 12 of the Standard Device Drivers Manual. Note that each driver has a unique name beginning with a dot (looks suspiciously like a period). A driver can have any name as long as it begins with a dot

(period) followed by a letter, is not more than 15 characters long, and contains *only* letters, numbers, and periods. Also note that an asterisk in front of a driver name means that driver is included in the driver file but is inactive. When flagged as inactive, that driver is not loaded into memory on bootup and cannot be accessed during program execution. The benefit of doing this is that you don't use up memory with drivers you are not currently using.

When you have finished reading the driver names press **ESC** to return to the SCP menu.

### Editing Driver Parameters

Next select the "Edit Driver Parameters" option on the SCP menu. The driver file you read into memory earlier probably had a driver named **.PRINTER**. On a new boot disk, this is most likely a serial driver. You can find out what it is by moving the cursor to highlight **.PRINTER** and pressing **«RETURN»**. You will then see a display which lists the device name, the type, the subtype, the activity status, comments, and driver configuration block information. At this point you are interested in whether the device is serial or not. You can usually assume **.PRINTER** is serial if the slot is indicated as "n/a", which indicates **.PRINTER** has been assigned to the built-in port. Unfortunately, few people bother to use the comments line to document in English how the drivers were configured.

If you are installing a parallel driver, you will probably name it **.PRINTER**, since this is generally accepted as the name of the most commonly used driver. Rather than delete the serial driver from the disk, give it another name such as **.SPRINTER** and deactivate it. You may want to use it later when you get your serial letter quality printer. While you're at it, use the comments line to indicate that this is a serial driver.

### Adding a Driver File

Assuming you're adding a parallel driver, insert the disk included with the UPIIC card in one of the drives (we'll assume Drive 2). Press **«ESC»** twice to exit the Edit Driver Parameters display and return to the SCP menu. Once again select the "Read a Driver File" option. This time, when asked for the pathname of the driver file, type **“.D2/PRINTER.DRIVER”**. This will cause the parallel printer driver file to be read from the UPIIC disk. Note that **PARALLEL.DRIVER** on the UPIIC disk is intended for communication between computers using a parallel interface and should not be used here. Note that the new driver's name has been added to the end of the list of drivers and that you may have two drivers with the same name. Press **«ESC»** to return to the SCP menu.

### Configuring the New Driver

The next step in this adventure is to configure the parallel driver for your particular printer and tell SOS in which slot your parallel interface card has been installed. To configure the driver, once again select "Edit Driver Parameters". The driver name will be **.PRINTER**, so you will probably have no need to change it. It will also be active. You should make an entry in the comments line to indicate what printer you are using.

Now for the hard part: tailoring the values in the Configuration Block for your printer. The Configuration Block can contain up to 255 values arranged in up to 16 rows of 16 values (the last row has 15). These values are used with serial drivers to specify baud rates, with the Silentype to control heating of the dots in the print head, etc. With the parallel driver, five values are used to tell the driver (1) what control signals in the cable are to be monitored, (2) what the normal values are, (3) whether the printer generates its own line feeds, (4) the polarity of the printer handshake signals, and (5) the printer response

timeout. To find out what these values should be for your printer, look on Page 19 of the UPIIC manual. Enter these values into the Configuration Block. If you do not see your printer listed, try using **“00 00 00 00 0A”**. Press **«ESC»** to return to the parameter list. When you are satisfied that they are all correct press **«ESC»** to return to the SCP menu.

### Changing System Parameters

All that remains is to tell the system where the parallel card is installed. This is done by selecting the "Change System Parameters" option. You will be shown a list of the current system parameters. Select the "Peripheral Slot Assignment" option to list the slot assignments. Most assignments will say "n/a", indicating built-in slots. To change a slot assignment, enter the number of the driver as shown on the display. When you are asked for the slot assignment, type it in. If you are unsure of the slot assignment, look at the openings in the back of the Apple and see which one has a filler plate labelled "Universal Parallel Printer Interface". From the rear, Slot 1 is on the right.

Note that it's possible to have two or more drivers assigned to the same slot. This would be done, for example, if you wanted to use both a dot matrix printer as a draft printer and a letter quality printer from the same program using the same interface and a switch box.

Press **«ESC»** to return to the listing of the Current System Parameters. Press **«ESC»** to return to the SCP menu.

### Generating a New System

The final step is to generate a new system that incorporates the new configuration information and install it on the disk. Select "Generate New System". There are two functions performed in system generation, validation of the configuration and storing of the new configuration on the disk. When validation is successfully completed, you will be asked for the name of the file where the new configuration is to be saved. You do not have to name the file **SOS.DRIVER** at this point. In fact, you can create a disk containing nothing but system configurations for different applications and transfer these to your boot disks as needed. They do have to be named **SOS.DRIVER** to be loaded on bootup and used.

If you decide to store the driver file on your disk under the name **SOS.DRIVER** and a file exists under that name, the SCP will ask if you want to replace it. If you answer yes, the old **SOS.DRIVER** will be lost. You might want to name it **NEW.DRIVER** at this point and preserve the original **SOS.DRIVER** file. When System Generation is complete, select the "Quit" option. If you have not performed a new system generation, a warning will be given and you will have to indicate that this is in fact what you want to do.

If you preserved the original **SOS.DRIVER** but want to try the new configuration, enter the Filer section of the Systems Utility and rename **SOS.DRIVER** something like **OLD.DRIVER**. Then change the name of **NEW.DRIVER** to **SOS.DRIVER**. If all went well, you should be able to print on your parallel printer when you reboot using the modified boot disk. If the printer doesn't work, start over and pay close attention to which parallel driver is read in, what slot is specified, and what Configuration Block information is entered. If the printer prints, but does strange things, the Configuration Block is likely to be the problem.

So there you have it. No longer will you wonder why your printer does either weird things or nothing at all when you tell it to print, and you'll enjoy the flexibility of configuring drivers for anything and everything.



# Changing an Apple /// CP/M Driver File

by *Mike Kramer*

*Houston Area Apple Users Group*

**A**lthough the procedure to add, change, or delete a driver under Apple /// CP/M is similar to that under SOS, it requires more steps and the steps required are not intuitively obvious. This discussion attempts to summarize those steps, but is not intended as a substitute for the manuals.

Because of constraints in the CP/M system, the peripheral driver file is named **DRIVER.SOS** rather than **SOS.DRIVER**. As supplied by Apple, the CP/M system knows about the console, Silentype, and serial drivers. It is totally ignorant of parallel devices. Your task is further complicated by the fact that CP/M only knows about four physical devices, consoles (CON:), tape readers (RDR:), tape punches (PUN:), and system printers (LST:). It permits up to four logical devices per physical device. Your driver file, however, can have as many drivers as you want within memory constraints. You just can't access all of them easily. A further complication is that apparently you can't look at the contents of the driver configuration blocks once the driver file is placed on the CP/M disk. You can see what drivers are included and which are assigned to the CP/M logical devices.

## Preparing the Driver File

The first step in adding to or changing the CP/M **DRIVER.SOS** file is to boot the Apple /// SOS Utilities Disk. Since the procedure for preparing a driver file is well documented in Chapter 2 of the Standard Device Drivers Manual it will not be discussed here. The main point to remember is that you start the procedure under SOS, not CP/M. Further, you should store the driver file on the CP/M Utilities Diskette under the name **DRIVER.SOS**. If you name it **SOS.DRIVER** you would overwrite the **SOS.DRIVER** file on the utilities diskette, which you may not want to do.

## Transferring Driver from SOS to CP/M

Insert the CP/M System diskette in the built-in drive (Drive A:); insert the CP/M Utilities Diskette in the external drive (Drive B:) and boot the system. Next type "**SOSXFER**" to run the SOS-to-CP/M file translation program. After an asterisk appears, type the following:

**B:DRIVER.SOS = A:SOS.DRIVER**

If you do not want to change the driver file on the CP/M System diskette, you will need to specify a different destination name on the left side of the "=" which would have to be used through the rest of the procedure described below.

After you specify the source and destination files and press **RETURN** the screen will then display:

Insert SOS disk into drive A:

Insert CP/M disk into drive B:

Press **RETURN** to begin

When the transfer is complete, the message "Transfer complete" will be displayed.

For more detail on the use of **SOSXFER**, see Page 74 of the Softcard /// Installation and Operation Manual.

## Configuring CP/M I/O

Replace the SOS disk in Drive A: with the CP/M System Diskette, press Control-C to do a warm start, and run the configuration program by typing "**CONFIG**". **CONFIG** will list the names of all the drivers in the **DRIVER.SOS** file, along with the current CP/M device assignments. Likely the device assignments will show that **CON:=CO1** and that **CO1:=.CONSOLE**. Also, it will probably show that **LST:=LS1** and that **LS1:=.PRINTER**. If you named the parallel driver **.PRINTER** then you are all set. If you wanted a Silentype to be the system printer and it is listed as **LS2**: you would just type **LST:=LS2**:. When the device assignments are as you want them, type **END** or a Control-C. You will then be asked if the changes should be made permanent. If you answer "YES", they will be written back to the built-in drive.

See Page 52 of the Softcard /// Installation and Operation Manual for a sample display and detailed explanation of the use of the **CONFIG** utility.

## Transferring **DRIVER.SOS** to Other Disks

Place any diskette on which you wish to have the new **DRIVER.SOS** file placed into the external drive (B:). Leave the CP/M System disk containing the new **DRIVER.SOS** in the built-in drive (A:). Press Control-C to tell CP/M a disk was changed. If you don't, you will get an error when you try to write to it. Next erase the **DRIVER.SOS** file on the disk in the external drive with the following command:

**>ERA B:DRIVER.SOS**

Next, transfer the new **DRIVER.SOS** from the CP/M System disk with the following command:

**>PIP B:DRIVER.SOS=DRIVER.SOS**

When this operation is complete, you should have a disk with the desired I/O configuration, assuming that you did everything correctly. If you want the same I/O configuration on another disk, just **PIP** it.



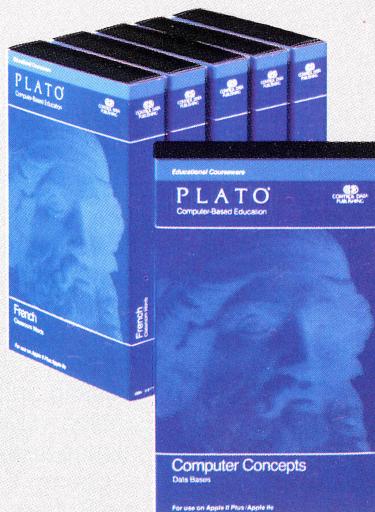
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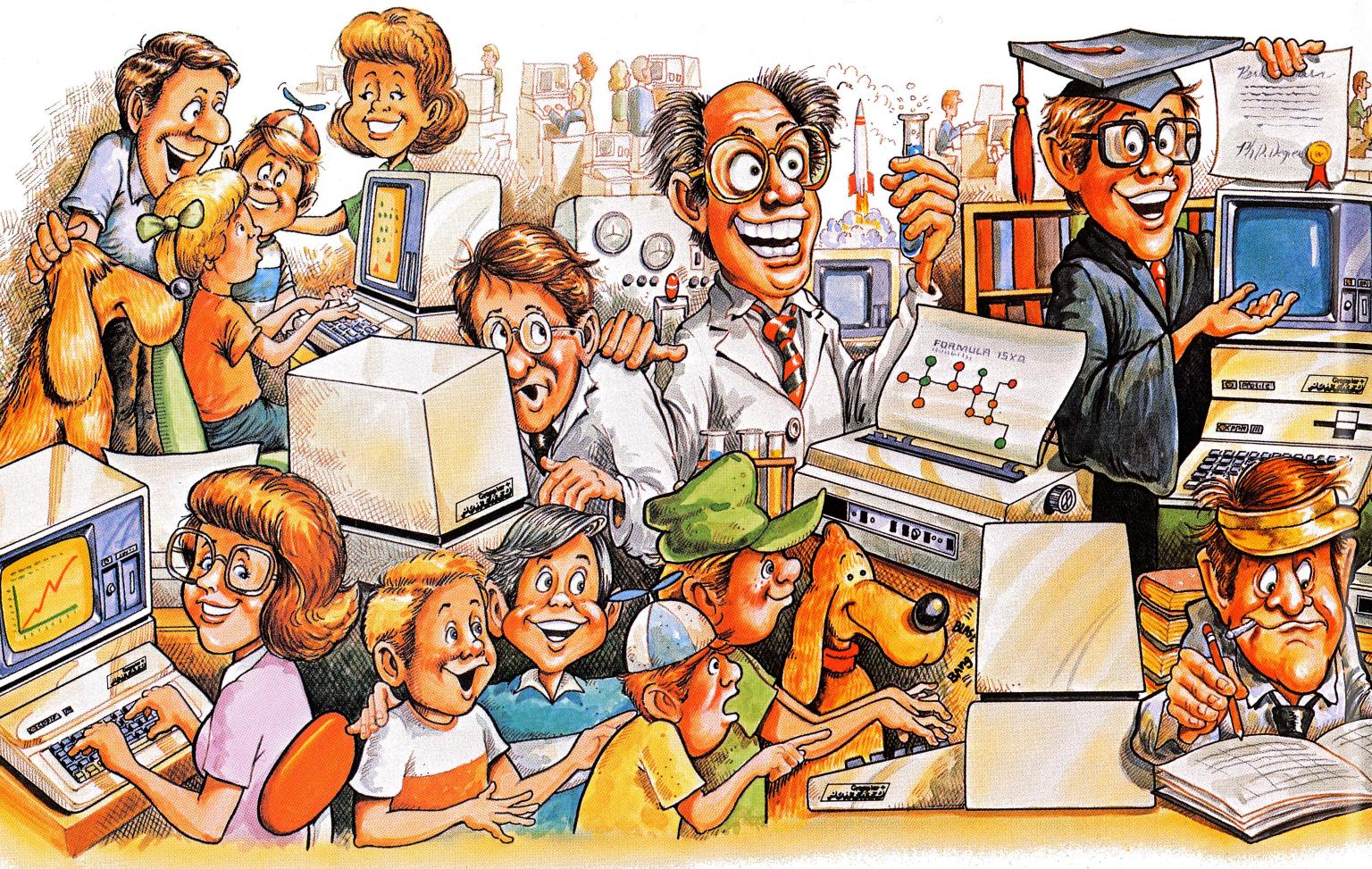
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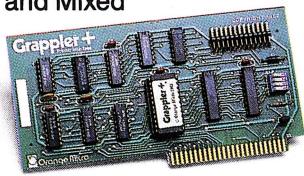


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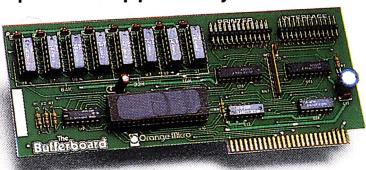
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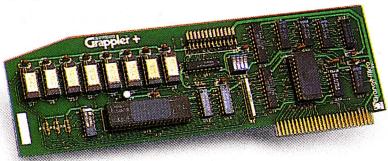
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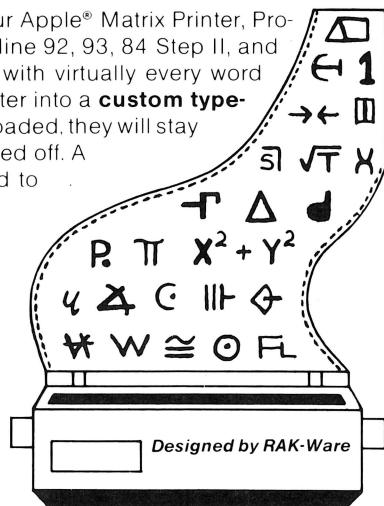
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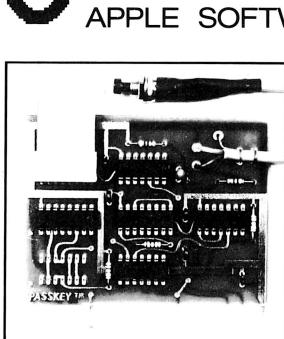


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# The Speediest Apple

*Review by Neil D. Lipson, P.E.*

This article will be the first part of a series on how to speed up your Apple II Plus or Franklin Ace 1000. I did not try these techniques on the //e, but most of them should work as well. The following items will be covered:

1. Ramex 128K card by Omega Microware
2. Microseeds Fastload
3. Diversi-DOS
4. Synetix SSD Disk Emulator
5. David-DOS
6. Saturn Accelerator II
7. Routine Machine by Southwestern Data Systems
8. Arithmetic Processor by California Computer Systems

All of these products have a speed-improving impact on your Apple; one or more of the processes will execute more rapidly than on a standard machine. What I wondered was, what would happen if more than one of these devices were used at the same time? Let me tell you that the results are spectacular! First, let's look at some general results; then we'll go into many techniques and describe in detail exactly what I did, and how you can accomplish the same results.

## High Speed DOS

In my previous article, *Speeding Up DOS (Apple Orchard, November-December, 1982)*, we covered some methods for fast disk access. Here's how to go one step further. I used the Saturn Accelerator II with the normal preboot supplied with the program. I then inserted the Synetix SSD disk and ran the disk emulation program. Some Hi-Res pictures were then loaded into the emulator. Once this was done, I used either Diversi-DOS or Fastload from Microseeds in the patch mode to "patch" the DOS to make it faster. For the most part, DOS then ran instantly. I could load Hi-Res pictures that normally took 10 seconds per picture in about 1/10 of a second, or 10 frames a second. This is twice as fast as without the Accelerator II.

The same thing, using the Ramex 128 card instead of the Synetix SSD, gives about the same results, with the proper patch to the operating system. The Ramex 128 can, of course, also be used for high speed VisiCalc as well as generally extending memory. I used a custom patch, but understand that many of the fast DOS people are developing their own patches. In addition, the Saturn software worked well on the Ramex card. The card is quite versatile.

## High Speed Applesoft and 6502 Operation

I then tried the following combination: the Accelerator II, the CCS Arithmetic Processor and some programming tricks, Applesoft ran up to 250 times faster. The Accelerator II made everything in the 6502 mode run faster, including games. Did you ever try to play Choplifter at a three-times-faster speed?

One of the slowest things to do on a computer is sorting. Even with the high speed sort programs, it still takes a while. Well, those days are over. I tried the Routine Machine sorting routines with the above hardware. The sorting routines are only a small part of Routine Machine, which we'll discuss in more detail later.

With the Routine Machine, and the Accelerator, sorts that normally took 5 minutes with my old Applesoft routines were done in about 6 seconds. Routine Machine has small machine language programs that append onto the main Applesoft program, and you use them accordingly. The package is amazing, and this is just one of many of their packages which we'll cover in future issues.

One aspect of Applesoft and DOS that drives everyone crazy is slow loading and saving of text files. There are numerous ways to speed them up. If you have a random access file, use Diversi-DOS. In quoting from their manual, Diversi-DOS contains an optional faster way to specify the record and byte parameters when reading or writing a random access text file from Applesoft BASIC. CALL 1005 sets these parameters to the values in the Applesoft variables name "RE" and "BY" respectively. The following example will illustrate how to use this feature:

Standard DOS way:

```
10 PRINT CHR$(4); "OPEN RANFILE, L500"
20 BY = 0
30 FOR RE = 0 TO 100
40 PRINT CHR$(4); "WRITE RANFILE, R"; RE; ", B"; BY
50 PRINT "TEST DATA"
60 NEXT
70 PRINT CHR$(4); "CLOSE RANFILE"
```

Diversi-DOS way:

```
10 PRINT CHR$(4); "OPEN RANFILE, L500"
```

```

20 BY = 0
30 PRINT CHR$(4); "WRITE RANFILE"
40 FOR RE = 0 TO 100
50 CALL 1005
60 PRINT "TEST DATA"
70 NEXT
80 PRINT CHR$(4); "CLOSE RANFILE"

```

The CALL 1005 is over 60 msec faster than the standard DOS PRINT command, which amounts to about a 2 to 4 times speed decrease.

The counterpart to Diversi-DOS is David-DOS. David-DOS, though, speeds up sequential text file loading instead of random access text files. Therefore, you choose the DOS that fits your needs. To accomplish this, use the TLOAD command. TLOAD speed loads a random or sequential text file starting at \$1000 or any address you choose with the "A" parameter. If you want less than the whole file, use the "L" parameter, otherwise, TLOAD always loads the whole track & sector list allotted to the file. This is necessary because DOS never records the last byte of a text file. We can't look for the first "0" as the end mark because we also load random files and they don't use an "0". Therefore, TLOAD without "L" loads the entire last sector even if the file ends in the middle of the sector. You can, if desired, make TLOADS to exact length with "L". Understand? Well, if you don't, examples are given in the documentation with the program.

Now let's go through each item and see what it does, and consider the advantages and disadvantages.

### 1. The RAMEX 128 card by Omega Microware

This card gives tremendous flexibility to do disk emulation, expand RAM and even act as a large print buffer using Diversi-DOS. It also has a high speed VisiCalc load (20 seconds), which is a pleasure, instead of having to wait up to 10 minutes. It's hardware compatible with the Saturn card, so the Saturn software will work properly with it. The only incompatibility is with the Rana controller card and Super Expander Plus. This appears to be a problem with the Rana controller, which will hopefully be corrected in the future. In addition, you must understand that the card only holds 128K, which is not quite a full disk. This does not include DOS, but the real problem is if the DOS is deleted and the space is used for something else, it just won't fit. This is a minor problem, however.

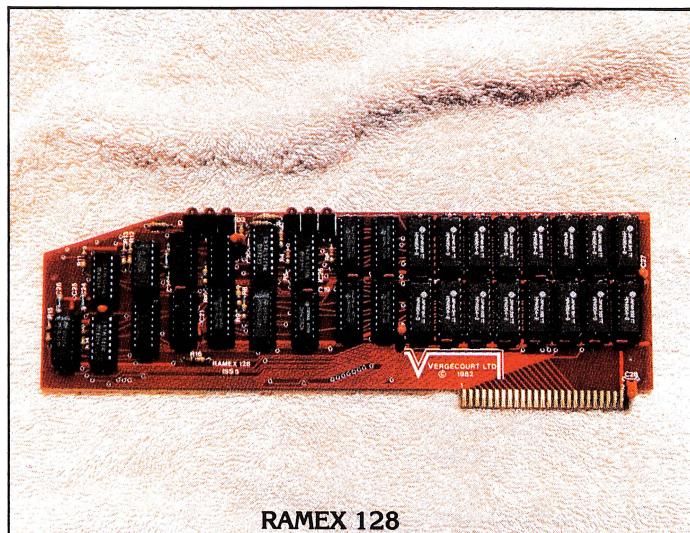
### 2. Microseed Fastload

This is a good general program that allows fast loading of binary and Applesoft programs. It also has a patch program to "patch" DOS when using it with the Synetix Disk emulator. It is compatible with almost every piece of software and is considered excellent for general use. It will not, however, speed up text files.

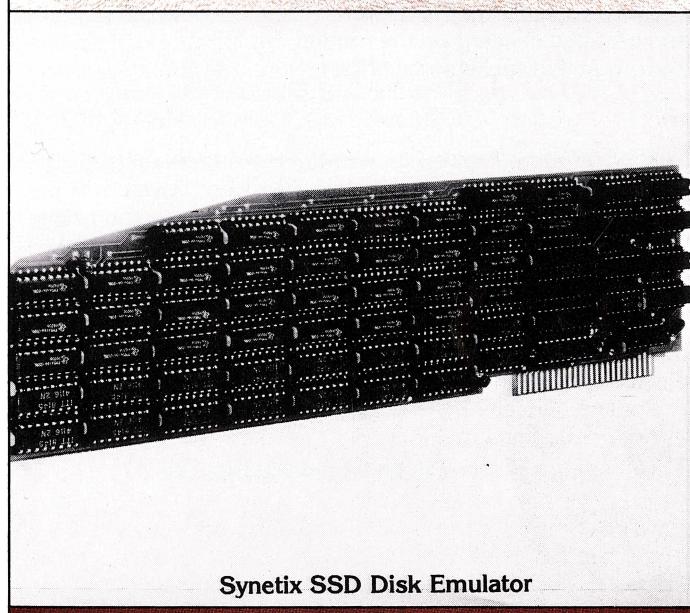
### 3. Diversi-DOS

Diversi-DOS has one of the most unusual marketing approaches known to man. *They tell you to give their program to everyone*, and if the recipient likes it, then he sends them about \$25. They will send you a sticker to put on your drive. Because the program is so reasonably priced and packed full of features, it is selling well. Bill Basham, head of DSR, Inc. is a programming genius in every sense of the word.

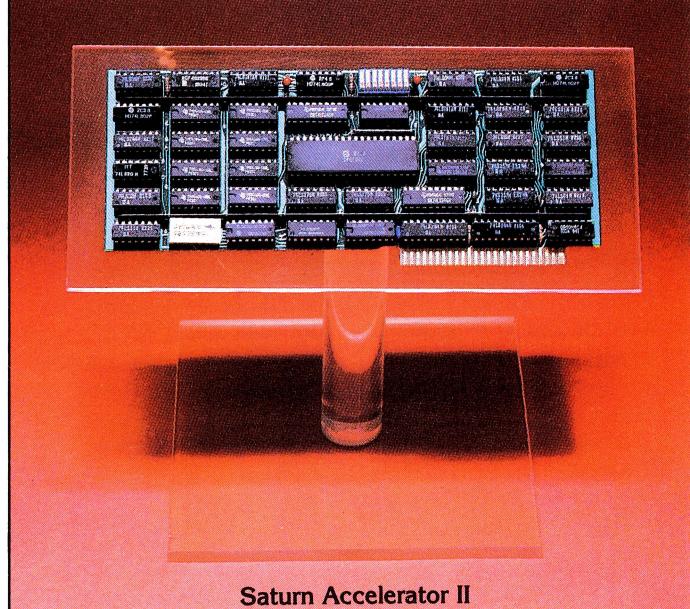
The instructions are on the disk, and will print out automatically if you want. Because Diversi-DOS modifies DOS, any program that has a "trick" DOS may not work properly with the



RAMEX 128



Synetix SSD Disk Emulator



Saturn Accelerator II

program, so be careful. This also applies to protected programs. There is a super fast back-up program on the disk that is a breeze to use.

Some of the more interesting features are the keyboard and print buffer utilities on the disk. This allows you to type on the keyboard while, for example, the drive is running, and not lose any characters. The print buffer is something else. I covered this point in great detail in my buffer article (**Apple Orchard**, April 1983), but for a short explanation, the computer must wait until the printer is finished printing before it sends more material. With the buffer option, the program is stored in the RAM card in Slot 0. If you have a Franklin, it comes with 16K there. If you replace it with the Ramex 128, you have a 128K print buffer! That can be more than 15 minutes of printing, which means you can use the computer for other purposes while the printer prints away.

The buffer is set up to work with a variety of printer cards and RAM cards. Even the PKASO card is included, which is about the best parallel card on the market. But be careful, because the program disables some of the features (temporarily) on the card.

DOS errors are given as numbers and this is also in the instructions. Random access text files were covered in the above, so they will not be repeated here. There was a bug in the first release of Version 2-C: when you read to the end of a text file with an ONERR in effect, you may read some extra garbage data before the ONERR is executed. To see if you have the bug, boot a disk with Diversi-DOS and type **PRINT PEEK (43519)**. The correct value is 223. If you don't see this value, then the following changes will fix the bug:

Boot Diversi-DOS disk and choose option #9

```
LOAD HELLO
2045 POKE 43519,223
SAVE HELLO
```

Use option 2 to add Diversi-DOS to all your disks again.

Interrupts are also discussed, but we'll not cover them here as very few of you will use them. Licensing information is also included along with many other commands. This program is top shelf in every respect.

#### 4. The Synetix SSD Disk Emulator

This card is the king of all disk emulators. It has 294K on it using 64K chips. It works very well with DOS, CP/M and PASCAL, along with many of the fast DOS programs. It also works very well with the Saturn Accelerator II. It can only be used as a disk emulator, and not for buffers or other uses, but for disk emulation, it is untouchable. This card was covered in my Speeding Up DOS article.

#### 5. David-DOS

David-DOS is another fast DOS program with some interesting features. Listed below are these added commands:

#### / CATALOG

TLOAD	SPEED LOAD ALL TEXT FILES
TLIST	LIST ALL TEXT FILES
DUMP	BINARY/ASCII
DISA	DISASSEMBLE BINARY
AL	ADDRESS/LENGTH OF LAST LOAD
HIDOS	MOVE DOS IN MEMORY TO CARD #0
FIND	FIND HEX CHARACTER SEQUENCES
DATE	PRINT MOUNTAIN HARDWARE DATE

The documentation is on the disk and can be printed out to the printer. It is quite comprehensive, and the program is a marvel of human engineering. David Weston, the author, is of the same genius caliber as Bill Basham of Diversi-DOS and Dave Winzler of Microseeds. It is a pleasure to have these three experts in the Apple field of programming. I also admire that all three have chosen not to protect their disk. This does wonders if you want to use it with other drives, disk emulators and the like.

The program is easy to use, and the FIND command is interesting. FIND searches for any hex sequence up to 31 bytes long. Hit return before entering the bytes. Put a space between each byte. Example:

#### Keyboard Entry

```
Screen
FIND
FIND
HIT RETURN
FIND HEX:
11 3C 45
FIND HEX:11 3C 45
HIT RETURN
(FOUND ADDRESSES)
```

The program is packed full of uses and I strongly recommend it.

#### 6. The Saturn Accelerator II

Since I purchased my Apple in 1977, I have been waiting for a card like the Saturn Accelerator II. The card has a fast (3.6 Mhz) 6502 and 64K of memory. It does all of the calculations while the Apple or Franklin does the video display. You now have both running at once, and the speed is incredible.

There are switches on the card which allow you to slow down certain peripheral cards, such as the drives. The card has a built-in language card, and the program is put into the memory of the card. A pre-boot is provided with the card with four options on it:

- A. Phantom 0 - You would use this for programs written in Integer or Pascal and for programs which require a language card, such as the arithmetic processor.
- B. Fast Applesoft - This option is specifically set up for speeding up Applesoft programs.
- C. Disable - This option is for all programs which run under CP/M when using the Microsoft Z80 Softcard. It is not needed if

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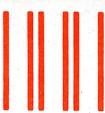
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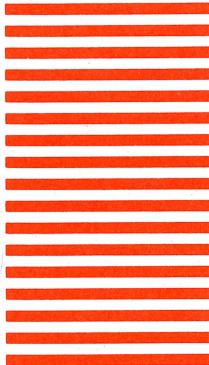
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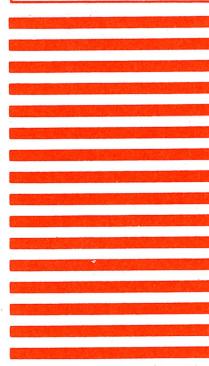
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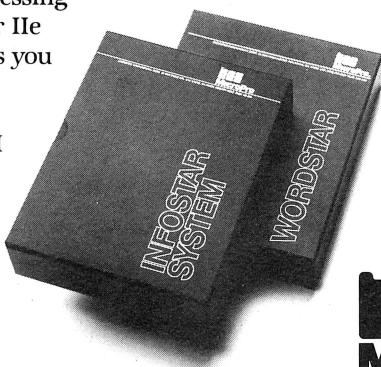
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The manual is written in two parts. The first part is for a quick introduction and quick set up. It allows you to use the board instantly for those of us that can't wait. The second part goes into all the detail that you need once you get over the initial excitement of trying the device. I happen to like the arrangement. Also given in the appendix is a complete list of programs and the recommended options to use. Many programs, such as VisiCalc, do not need the preboot.

At this writing, this card is the only one of its type, so there is no competition. If you want to speed up the computer, this is a sure-fire way to do it.

## 7. The Routine Machine

Southwestern Data Systems has always had a reputation of having some of the finest programs available for the Apple. This goes way back when they came out with Apple Doc, and they haven't stopped giving us excellent software since then. Their packages seem to get better with each addition. One of their latest selections is The Routine Machine.

The Routine Machine is a series of programming utilities which can be used with Applesoft programs. You can have the speed and versatility of machine language in Applesoft without knowing machine language, and you can pass variables back and forth from the utility to the program with no problems whatsoever. You decide where in memory to locate the routines, and more than one routine can be used. No debugging is necessary, and use of these routines is simple. A demonstration program is included on the back of the diskette for illustration purposes. An option menu is given and you choose the appropriate selection.

The manual is about 160 pages long, and is packed full of ideas and uses. For the Applesoft programmer, it is heaven. An excellent appendix is also included for references. The package is a piece of art.

Some of the main points of the package:

A. SWAP - This swaps two Applesoft variables without requiring a third variable and without generating garbage which would have to be handled later.

B. PRINT USING - Formats numbers for screen, printer or disk file output. It makes monetary information easy to display.

C. TEXT OUTPUT - This will print text to screen or printer without word breaks at the right margin. It is similar to word-wrap in a word processor.

D. STRING INPUT.RM - This wonderful routine will allow you to enter in commas and colons in input strings. (Try doing this without this routine!)

E. STRING SEARCH - This function find a substring within another larger string. (Where were all these wonderful routines when I began programming the Apple in 1977?)

F. ARRAY SEARCH - This is used in searching a one-dimensional string array for the occurrence of a specified search string, or for the occurrence of a string standing in a certain relation to the search string.

G. BUBBLE SORT - Here we sort the elements of a one dimensional string array, placing all the empty strings at the end.

H. BEEP - Generates a pure tone of a given pitch and duration. It can also be used to pause a program. Extrememly useful for

generation of music.

I. SOUND EFFECTS - Simply lets you use sound effects in your program.

J. FIX LINK FIELDS - This recalculates and establishes the link fields in an Applesoft program.

K. ERR - This function fixes the stack pointer in preparation for continuing the operation of a running Applesoft program when RESUME will not be used. It will also optionally return the error code and line number of the error.

L. ERR MSSG - This will print the usual Applesoft or DOS error message from a running program without halting program execution. (Can you believe all this for \$64.96?)

M. GOTO - This allows the equivalent of Applesoft's GOTO statement with the line number specified being given by a variable.

N. GOSUB - This allows the equivalent of Applesoft's GOSUB statement with the line number specified being given by a variable.

O. LINE DATA RESTORE - This performs a similar function to Applesoft's RESTORE command, with the exception that the line number to which the DATA pointer is restored can be specified.

P. DATA ELEMENT SELECT - This advances the DATA pointer a given number of positions relative to its current position. This gives a random access-like aspect to DATA statements.

Q. XNUM - This will convert numbers between decimal and hexdecimal notations.

R. MEMORY MOVE - Moves a block of memory from one location to another.

S. RESTORE AMPERSAND - This will restore the ampersand vector to its original value, as it was before the Applesoft program was run.

T. PTR READ - This will read any two byte pointer in memory and return the decimal value in a numeric variable.

U. PTR WRITE - This sets any two byte pointer in memory to the value or address specified.

V. SHAPE GOBBLER / SHAPE VIEWER - This is a utility provided to convert existing Applesoft shape tables into usable Routine Machine Modules.

W. SHAPE TABLE VIEWER - This utility is provided to allow you to examine raw shape tables. this can be useful, especially in cases where you might not even be sure if a binary file is in fact a shape table.

X. HIRES ASCII - This is a shape table of 95 ASCII characters used for printing test on the HIRES screen.

Y. BLOAD - This BLOADs binary files about 4 times faster than normal. It will not, however, speed up fast DOS diskettes that I have seen.

Z. BINADR - Returns the length and load address of any binary file on a disk, without loading the file.

AA. RESET NORM - This sets the RESET vector back to its normal condition, so that pressing RESET will put the use in direct command mode with an Applesoft prompt

BB. RESET ONERR - This sets the RESET vector so as to generate an Applesoft error code when RESET is pressed. If an ONERR GOTO statement is in effect, control will then pass to the error-handling routine as in the case of a normal error occurrence.

CC. RESET RUN - This sets the RESET vector so as to re-run the current Applesoft program when RESET is pressed.

DD.RESET BOOT · This will boot the computer when RESET is pressed.

EE. FREE SECTOR COUNT · This allows determination during program execution of the number of free sectors on a disk in a selected drive.

It should be mentioned that not all of these programs speed up the software, but because they are written in machine language, they certainly do run faster than a normal Applesoft program. The other benefits are additional.

#### 8. The CCS Model 7811 Arithmetic Processor

The 7811 Arithmetic Processor Unit from California Computer Systems is a powerful floating-point hardware unit which, under the control of the CCS Applesoft on the supplied diskette, significantly improves the execution speed of mathematical functions. Program execution speeds can be increased by as much as 70 to 1, depending on what function you are working with.

The only drawback is that you have 6 significant digits instead of the usual 8. This, in my opinion, is a small sacrifice. If you must have 9 digits, turn the card off and operate Applesoft normally.

I have not tried this card out on the Apple //e, but California Computer Systems recently informed me that the Arithmetic Processor has been tested on the //e and is compatible. The card plugs into any slot, and you simply boot the enclosed diskette.

The following benchmarks were done to illustrate the speed difference of this card:

Function	Speed Ratio
MUL	1:1.76
FDIV	1:2.56
EXP	1:10.07
SQR	1:71.24
RND	1:3.50
LOG	1:7.98
COS	1:9.48
PWR	1:4.80
TAN	1:15.50
ATN	1:13.55
INT	1:1.18
ACOS	1:32.20
ASIN	1:27.62
LOG10	1:23.98
PI	1:12.44
INV	1:3.50
SINH	1:10.57
COSH	1:10.66
TANH	1:8.08

As you can see, some of the improvements are substantial. The card works well with the Saturn Accelerator in the limited testing that I did.



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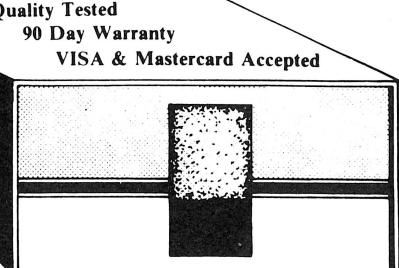
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# The Accelerator II

*Review by Barry D. Bayer*

**S**aturn Systems, Inc., of Ann Arbor, Michigan has moved from high density memory expansion boards and VisiCalc pre-boots to a \$600 board with a "fast" 6502C and 64K of "fast" RAM (Random Access Memory), that will make your Apple II really move.

The Accelerator board installs with very little problem by dropping into Apple Slot 0, 1, 2, 3 or 4. But which Slot? Slot 0 is not recommended for various reasons, Slot 1 contains my printer interface, 2 my modem, 3 my 80 Column Card, and 4 my 128K card. My modem-terminal program (Hello Central!) is very easily configurable, so I banished the modem to 5, liberating Slot 2 for the Accelerator board.

Because the board does not speed up speed dependent tasks such as modem communications and disk I/O, I was also required to set DIP switches and to notify the Accelerator board which slots should operate at standard speed. And that's all the installation there was. No screwdriver, no IC puller, no soldering iron.

Many programs (there's a list in the manual) will boot and run without further ado. For others, it is necessary to pre-boot a disk which will allow you to make the Accelerator board a phantom Slot 0, to add machine code which speeds up the language in ROM on your motherboard, or to disable the Accelerator board, completely (but only until powerdown or rebooting of the Accelerator disk). There's a routine to modify the Pascal APPLE1 disk, or its equivalent, and another to modify a CP/M disk (to turn the Accelerator board off if you're using CP/M). (It doesn't do too much good to add a fast 6502 if you're still using a slow Z-80.)

The preboot works even if the application program you are trying to use is copy protected. Most programs seem to work with the Accelerator board on, although they crash unless you turn the Accelerator board, first, using the preboot. (For example, the Videx 80 Column card preboot for Applewriter II doesn't work properly unless you turn the Accelerator card off. Why would anyone need an Accelerator board for a word

processor? Well, it scrolls faster, searches faster, and completely eliminates any typeahead. It's not crucial, by any means, but it is handy.

The first thing I did after installing the Accelerator board was to boot VisiCalc, and try it out with a large template which used to take over a minute to recalculate. With the new installation it took 22 seconds. I then ran some tests with time consuming formulae, and things did speed up considerably. (One change that is immediately noticeable is that the VisiCalc "beep", which is undoubtedly generated by a machine language subroutine which "toggles" the speaker for a given length of time at a given frequency) is much shorter, and octaves higher. (It turns out that all such sounds including "music" and "buzzes" end up much higher and shorter, leading to some amusing and unanticipated effects.) VisiCalc loading speeds up a little; as previously stated, disk access speed is not altered, but accelerated VisiCalc processes information coming off the disk so quickly that the drive never stops. But VisiCalc is so quick, in most cases, that it's really difficult to say that it "feels" different with the Accelerator.

But try a pre-boot such as Omega Microware's Super Expander Plus, with a Videx 80 Column card, and a 128K card, and you get a program which "feels" slow. Clearing memory, using the /C command takes about 10 seconds without the Accelerator, and 3 and a half seconds with the Accelerator. Recalculating a 136K file takes a long time without the board, but a third or less as long with the board. Scrolling the 80 column card can be jerky and slow, but not with the Accelerator board, which speeds things up so much it is almost like 40 column video. The expanded program is so different that the speedup is immediately noticeable.

So much for impressions. From time to time certain "benchmark" programs are published to indicate how fast a particular computer is. One set was published in the January, 1982 issue of *BYTE Magazine*, in Gregg Williams' article on his first glimpse of the IBM Personal Computer. The five programs constituting the Benchmark are shown in Figure 1.

	Byte Tests			Bayer Tests		
	IBM PC	Apple II	Apple II w/o Acc.	Apple II with Acc.	% of Time of:	
					Apple Time	IBM Time
Test 1	6.43	6.66	6.2	2.1	.34	.33
Test 2	23.8	29.0	26.3	8.7	.33	.37
Test 3	12.4	13.9	12.3	4.3	.35	.35
Test 4	23.0	32.3	27.7	9.3	.35	.42
Test 5	190.0	241.0	194.8	66.4	.34	.35

Figure 2

```
1 PRINT CHR$ (7)
60 A = 2.71828
80 B = 3.14159
```

```
100 FOR I = 1 TO 5000
```

```
320 NEXT I
```

```
1000 PRINT CHR$ (7)
```

Test 1

```
1 PRINT CHR$ (7)
```

```
60 A = 2.71828
```

```
80 B = 3.14159
```

```
100 FOR I = 1 TO 5000
```

```
120 C = A / B
```

```
320 NEXT I
```

```
1000 PRINT CHR$ (7)
```

Test 2

```
1 PRINT CHR$ (7)
60 A = 2.71828
80 B = 3.14159
```

```
100 FOR I = 1 TO 5000
```

```
120 GOSUB 1000
```

```
320 NEXT I
```

```
500 PRINT CHR$ (7)
```

```
600 END
```

```
1000 RETURN
```

Test 3

```
1 PRINT CHR$ (7)
```

```
80 A$ = "ABCDEFGHIJKLM"
```

```
100 FOR I = 1 TO 5000
```

```
120 B$ = MID$ (A$, 6, 6)
```

```
320 NEXT I
```

```
1000 PRINT CHR$ (7)
```

Test 4

```
1 PRINT CHR$ (7)
2 SIZE = 7000
3 DIM FLAGS (7001)
```

```
4 PRINT "ONLY 1 ITERATION"
```

```
5 COUNT = 0
```

```
6 FOR I = 1 TO SIZE
```

```
7 FLAGS(I) = 1
```

```
8 NEXT I
```

```
9 FOR I = 0 TO SIZE
```

```
10 IF FLAGS(I) = 0 THEN 18
```

```
11 PRIME = I + I + 3
```

```
12 K = I + PRIME
```

```
13 IF K > SIZE THEN 17
```

```
14 FLAGS(K) = 0
```

```
15 K = K + PRIME
```

```
16 GOTO 13
```

```
17 COUNT = COUNT + 1
```

```
18 NEXT I
```

```
19 PRINT COUNT, " PRIMES"
```

```
1000 PRINT CHR$ (7)
```

Test 5

Figure 1

(For an explanation of what these programs do and why they were chosen, see the Williams article on Page 54 of January 1982 *BYTE*. The programs here are the same, with the addition of a line to ring the Apple's "bell" at the beginning and end of each program, to help with starting and stopping the timings.) In general, the *BYTE* article showed the Apple to be between 4 and 27 per cent slower than the IBM PC.

Figure 2 shows the raw results of my tests. For reference I have included the *BYTE* Apple and IBM results. For some reason, my figures for the Apple without the Accelerator board are less than *BYTE*'s, but the real contrast comes with the Accelerator board. In all cases, the accelerated Apple took about one third the time of the regular Apple, which means that the Accelerator board makes the Apple a *lot* faster than the PC.

But the Accelerator board is not an unmitigated pleasure. Saturn Systems has set the Accelerator board to automatically slow down for disk access and modem operation, but games are not automatically slowed. (Pinball or PacMan are simply impossible going three times faster.) If you move around a lot between one program and another, you're going to be turning off your computer and doing a cold boot, more often than without the board. But you can live with that. What you might not be able to live with is a 500 milliamp draw. (That's 25 per cent of the maximum current rating of Apple's power supply.) Now my Apple is still working with the lineup shown in Figure 3, but I really wonder how close I'm getting to my power supply's limit.

```
Slot 0 - 16K Memory Expansion
Slot 1 - Mountain Hardware CPS Multifunction Card
Slot 2 - Saturn Accelerator card
Slot 3 - Videx Videoterm
Slot 4 - Hayes Micromodem II
Slot 5 - 128K Memory Expansion
Slot 6 - Disk Controller
Slot 7 - blank (Barry, how could you?—PCW)
```

Figure 3

Last, but certainly not least, the Accelerator board has a manufacturer's suggested retail price of \$600. That's a good percentage of the cost of an Apple system. Is the board worth the money, or should you use it to "upgrade" to a new, modern computer, or even half a 5 magabyte disk. That's a very personal decision and, I suppose it depends on how you use your Apple. If it's strictly a game machine, the answer is no. (Let me take back a little bit of that. If the game the computer is playing is chess, the answer might well be yes.) If you use a lot of large memory 80 column VisiCalc, the answer might be yes, although things like Lotus Development's 1-2-3, which is not being provided for the Apple, make a strong argument for purchasing an 8088 based computer. If your programs tend to be disk bound, the Accelerator board will probably not speed it up much by itself. If the program does a lot of calculating and/or a lot of string handling (really fast garbage collection with the Accelerator board) it may help.

Finally, if you'd like to look your friend in the eye, (the one who purchased an IBM PC last month, and is chiding you to junk your "toy" and get a "real business computer"), and explain that your Apple is two and a half times faster than his pokey PC, then the Accelerator board is a must.



# WPL - The Sleeping Giant

## Part One - Introduction

by *Richard Loggins*

**H**idden deep inside your AppleWriter is an enormously powerful force just waiting to be unleashed. Once aroused from its dormant state, its power can be harnessed to perform feats of magic. It's called Word Processing Language (WPL for short), and is probably the most overlooked feature of AppleWriter.

Once under control, this power can be used to print any number of form letters, specialized reports, quotations, and more. It can personalize letters, insert financial information, and even replace other software you would normally purchase. WPL won't replace VisiCalc or Multiplan, but it can provide an acceptable alternative to mailing lists and small databases.

This series of articles will remove the mystical shroud surrounding WPL. It will help you to take advantage of what you already have - hopefully without frustrations.

We'll start with simple WPL commands and build on them a little at the time. WPL programs will be developed that will allow some pretty neat and useful applications. You'll be surprised to discover that you've already used many of the WPL commands that we'll discuss.

As an added benefit, the WPL programs should work for AppleWriter /// and AppleWriter //e. Just pay attention to the file name notations and you'll do fine.

### Command Origins

WPL commands can originate from (1) the keyboard, from (2) a text file, or from (3) *within* a text file as it is being printed.

When the command originates from the keyboard, it is known as originating from the *immediate* mode. Commands that come from a text file, or a text file as it is printed, are known as originating from the *deferred* mode.

If you have used AppleWriter, at one time or another you have used the **CTRL-P** command to view or change the current printing parameters. By changing any of the printing parameters, you have already been using WPL, although you didn't know it!

In fact, you use WPL each time you load a file, save a file, change character sets, etc. All of the AppleWriter immediate mode commands are actually WPL commands. That ends the tutorial on WPL immediate mode. Easy, wasn't it?

Now that you have mastered the immediate mode (and even if you haven't), it's time to conquer a little of the deferred mode via printing a text file.

If you have printed letters or other files using Apple Writer, you have probably embedded printing format commands within the text. The most common command used is the ".ff" (or ".FF" if you prefer) to issue a form feed. This command causes the printer to advance the paper to the top of the next page. Surprise: this is also a WPL command!

The rest of this article will be devoted to the WPL commands that originate from a text file on disk, how they are used, and WPL programs.

### Text Commands

Commands are one or more of a specified set of instructions that tell your computer what action to take. Commands are nothing more than a predetermined sequence of characters, and are easier to learn than a foreign language or shorthand.

WPL commands are composed of one to three letters. Each command will cause a specific action to take place. The shortest command is simply the letter "P", which is used to insert a comment into the program.

Comments are brief statements that explain portions of the program. They are not required, and are totally ignored during program execution.

Many of the commands used in a WPL program are identical to the commands used during normal operation of AppleWriter. The command to load a file **CTRL-L** is the same in normal operation and in a WPL program. Both must be followed by a legal file name, and both will load a file.

The primary difference between normal operation and execution of a WPL program lies in the understanding of what

you can't see. Under normal operation, you can see the CONTROL key being pressed; under WPL you can't.

This brings forth the first rule:

**Rule 1: The first character in a line following a blank character is treated as a control character.**

This means if the first letter on a new line is a space, and the space is followed by the letter "L", the letter "L" is treated as **CTRL-L**.

So a command such as

L .D1/MYFILE

with a space preceding the "L", would be interpreted as meaning "LOAD from Drive 1 the file named MYFILE", and would act accordingly. This allows use of all the CONTROL commands normally used in AppleWriter from the immediate mode.

Which brings up the question of why it was mentioned in the first place. Under WPL program control, AppleWriter uses two different displays, both of which can be viewed on your monitor.

One display is the normal display you see whenever you use the text editor portion of AppleWriter. The other screen display we will call the WPL display. It is used to inform you what is taking place, to request information from you, etc., while a WPL program is being executed.

To clear the text editor display, you enter **CTRL-N** followed by **Y**, and press **«RETURN»**. This will erase the text editor display, along with any file you currently have in memory.

The WPL display is another matter. It is erased by using a **CTRL-«Backslash»**. In a WPL program, this command would appear as:

**PPR«Backslash»**

with a space preceding the first P. More on this later.

Simply having all of the CONTROL commands normally used by AppleWriter isn't enough to accomplish very much. There are two more essential items we must include to make effective use of WPL.

The two items we must add are labels and variables. Fortunately, both of these items exist, leaving only the problem of understanding them.

We can now say that a WPL program consists of only three items: labels, commands, and variables.

### **WPL Labels**

Labels are to WPL programs what road maps are to travelers, or addresses are to mail carriers. Labels provide WPL with a method to identify a unique location. And like addresses, no two should be the same.

Labels are not required in a WPL program, but they are used to control the sequence of program execution. Labels are the creation of the person writing the program, and generally are descriptive of the function performed by a part of the program.

For instance, suppose you have a label named "LOOP". If the program is directed to go to "LOOP", it will do so and carry out the instructions following the label. This brings up the rule for labels:

**Rule 2 If the first item in each line is not a blank character (a space), all of the following characters up to the first blank character are treated as a label.**

For our program listings, we'll use a format that should make it easy to identify labels from commands. Each program will have the heading shown below, followed by one blank line. Labels will start to the left of the space following "WPL", and commands will be indented to start at the right of the space.

**WPL Program: [Program Name]**

**LABELS will start here.**

**COMMANDS will start here.**

WPL programs are created by using the text editor portion of Apple Writer. When you enter these programs, be sure to start your program with the first label, and *not* our program indicator (the part that says "WPL Program").

### **Variables**

WPL supports two different types of variables. The first type is called *numeric* variables, and the second type is called *string* variables.

Numeric variables are used for representing numbers. There are only three numeric variables in WPL, represented by the letters X, Y, and Z.

String variables are used to represent a series of characters. This can be letters, numbers, or a combination of both. WPL provides four string variables: \$A, \$B, \$C, and \$D.

If you have experience programming in BASIC, don't be alarmed by the position of the "\$" in the string variable name. In WPL, the "\$" always comes before the variable.

### **WPL Program Construction**

Now that the components of a WPL program have been introduced, we'll cover a few basic rules about WPL programs, and put this information to use. As the man said, a picture is worth a thousand words.

After each program listing, a line by line discussion will examine each command and what it does.

Our first WPL program will be simple. It will load a file from the disk in drive one and print the file. For Apple /// owners, drive one is the internal drive. For Apple II owners, drive one will be Slot six, Drive one.

Conventional Apple /// pathnames will be used ("D1/") to refer to the drive. If you have an Apple II, make sure you change this reference to agree with DOS and Apple Writer //e.

Before a WPL program can be written to load and print our test file, we must first have a file to work with. The letter shown in Figure 1 will be used as our test file, and will be modified occasionally to suit our needs.

Get your Apple Writer up and running; type the letter, and save it with the name of "TEST.LETTER" on the disk in drive one.

When you have the letter saved on your disk, erase memory and enter the following WPL program.

**WPL Program: PRINT.LETTER**

**INITIALIZE**

**PND**

**NY**

**LOAD**

**L .D1/TEST.LETTER**

**PRINT**

John Johnson  
123 Oak Street  
Denver, CO 88888

Dear John:

We are having a party to celebrate Independence day, and would like you and your wife to attend.

We'll supply all of the food and drinks, so all you have to bring is yourself and your wife.

The party will start at 4 p.m. and last until everyone is tired.

Sincerely,

Sam Smith

Figure 1

PNP  
QUIT  
PQT

Check each label to make sure it starts at the very first position in each line, and that the commands are indented. Remember, WPL won't recognize the labels if there is a blank character (space) in front of them.

When you are sure the program is correct, name it "PRINT.LETTER", and save it under that name on your disk.

Let's analyze the program and see what it will do. The first line of the program is a label. This label describes this part of the program as "Initialize", and is where our initial procedures are located.

The second line contains the command PND, which will turn off the text editor display (N for NO and D for Display). This only turns off the text editor, and not the entire video display.

By turning off the text editor display, our WPL program will have control of what is displayed on the monitor. With the text editor turned off, the WPL program will also execute about five times faster.

Line three, NY, is a command to clear memory. Since WPL treats the first character (N) following a blank character as a control character, this command is equivalent to entering CTRL-N followed by a Y from the keyboard in the immediate mode. The result is to erase memory and clear the text editor. That's why you saved both the letter and the WPL program to disk first.

Line four is another label. It describes the portion of our WPL program that will load the file.

Line five is a command. Again, the "L" is treated as a control character, making the command CTRL-L. This is followed by the location (.D1), a delimiter (the slash), and the name of the file to load. That's Apple //, remember: on the Apple II//e, it would be L TEST.LETTER,D1.

Next is another label. This label describes the routine that will print the letter.

In line seven we use the command that will cause the letter to be printed. This is equivalent to entering CTRL-P, followed by NP from the immediate mode, and will result in printing the letter.

The last two lines of our program provide a formal ending. The label QUIT is followed by the command PQT, the command that will terminate a WPL program.

Before we use the WPL program, check your printing parameters and your printer. Get back into the text editor portion of Apple Writer, and we'll use our program (WPL programs *cannot* be executed from the printing parameters portion of Apple Writer).

Now, enter CTRL-P from the keyboard. The lower portion of your monitor should display:

[P]rint/Program:

Enter DO .D1/PRINT.LETTER, followed by the "RETURN" key. This will cause our WPL program to be executed. If you have entered everything correctly, the WPL program will load the letter, print it, and return control back to the text editor.

Since we ended the WPL program without clearing the text editor memory, the letter that was loaded by the WPL program will still be in memory, and should be displayed on your monitor.

If the WPL program does not execute as it should, press the "ESCAPE" key. The "ESCAPE" key will abort any WPL program, and return control to AppleWriter.

### Play it Again

Printing a single copy by using a WPL program is more difficult than just printing a letter directly from AppleWriter. But our simple WPL program has provided the foundation for more complicated applications that will overcome this limitation.

By changing this WPL program, we can print up to 65,535 copies of any file, all automatically. This is accomplished by using a variable and a loop.

Clear memory, and enter the following WPL program. This

program will print five copies of our invitation, and demonstrate how variables and loops can be used.

WPL Program: PRINT.5

```
INITIALIZE
  PND
  NY
  PSX 5
LOAD
  L .D1/TEST.LETTER
PRINT
  PNP
  PSX - 1
LOOP
  PCP
  PSX - 1
  PGO LOOP
QUIT
  PQT
```

After entering the program, give it the name of "PRINT.5", and save it on your disk.

The first three lines of this WPL program are the same as our first WPL program. The text editor display is turned off, and memory is cleared.

In line four, we encounter a new instruction, **PSX 5**. This command ("PS") can only be used with numeric variables. Here, it sets the variable X to equal five. This is the number of copies we want our WPL program to print.

Line six loads our invitation, and line eight, **PNP**, prints the first copy.

In line nine, the **PSX** command is encountered again, but is used differently. Instead of setting the variable X to a predetermined value, the number contained in X is decremented by one, leaving the number four in X (five minus one is four).

The **PSX** command can be used to set the variable X to a specified value, subtract a specified quantity from the present value of X, or add a specified quantity to the present value of X.

Line ten introduces a new label, **LOOP**, that will be used to control the printing of the remaining four copies of our invitation.

Line eleven is a new command, **PCP**, which causes the next invitation to be printed. This command is the same as the "Continue Printing" command used in the immediate mode. **PCP** is used instead of the **PNP** command. This takes into account the top margin and top line options of the printing parameters in the event they are used.

Line twelve decrements the variable X again, leaving the number three in X.

The instruction in line thirteen, **PGO LOOP**, is a branch command. When this command is encountered, WPL will search the program for the label "LOOP", and transfer control of the program to the instructions following the label. In effect, this command says "GO to the label named LOOP."

This will cause the command **PCP** to be executed again, followed by the **PSX** command. Thus, we have set up a loop that will print several copies of our invitation.

To terminate the loop, we rely on the variable X. When the variable X is decremented to zero, the **PGO LOOP** instruction will be ignored, and control of the program will proceed to **QUIT**.

This action is known as a "controlled error" situation. Whenever a variable in WPL is decremented to zero, an error is generated. Whenever an error is generated, the next instruction is ignored.

In this program, the error will be generated after five copies of our invitation have been printed, breaking the loop and ending the program.

To use this WPL program, again enter CTRL-P followed by **DO .D1/PRINT.5** from the text editor.

### Pick a Number

As the last WPL program ("PRINT.5") is written, it will print five copies of the invitation. All well and good if all we will need is five copies. However, there may be times when it is desirable to print more or less than five copies.

By introducing three new commands, the WPL program can be modified to print as many copies as needed.

Clear memory, load the WPL program named "PRINT.5", and make the following changes. Save this program with the name of "PRINT.NUMBER" on your disk.

WPL Program: PRINT.NUMBER

```
INITIALIZE
  PND
  NY
  PPR<Backslash>
GETNUMBER
  PIN How many copies? =$A
  PCS/$A/0
  PGO QUIT
  PSX $A
LOAD
  L .D1/TEST.LETTER
PRINT
  PNP
  PSX - 1
  PGO LOOP
  PGO QUIT
LOOP
  PCP
  PSX - 1
  PGO LOOP
QUIT
  PQT
```

The first three lines of the modified WPL program are the same. Line four of the program introduces a new command **PPR«Backslash»** that will clear the video display.

This command is composed of two items. The command **PPR** tells AppleWriter to print on the WPL video display the information that follows. In this case, it is printing a CONTROL-«Backslash».

To enter this command, you must press **CTRL-V**, followed by a **CTRL-«Backslash»**, followed by another **CTRL-V**.

The result you should see on your monitor is the backslash displayed in inverse (dark letter in white block.) The CONTROL-V allows control characters to be entered into your text that will be passed to a device without affecting AppleWriter. Be careful entering this command.

Line five, **GETNUMBER**, is a new label that begins the routine to determine how many copies are to be printed.

Line six contains a new command, **PIN** that will wait for an entry. When this command is executed, the message "How many copies?" will be displayed on the video monitor.

When a number is entered and «RETURN» is pressed, the number will be placed in the "\$A" variable. Notice there is no space between the equal sign and the \$A variable.

Line seven introduces another new instruction, the **PCS** command. Notice there are no spaces in this line (other than the spaces preceding the command). This instruction is used to compare the information contained between the first and second slash marks, with the information contained between the second and third slash marks.

In this case, it is comparing the number contained in \$A with the number zero. If the two items being compared are identical, the result is said to be valid, and no error is generated. Therefore, if a zero was entered for the number of copies to be printed, the result of the comparison would be valid, and no error would be produced.

The result of this comparison will determine what action the program will take. If the two items being compared are *not* identical, the result is said to be invalid, and an error is generated. So if a number was entered that was not zero, the result will be invalid, and an error will be generated. As with numeric variables, when an error is produced, the next instruction, to quit, is ignored.

If the user entered a zero, no error will be generated, and the **PGO QUIT** command will be executed. This will cause the WPL program to end, as there are no copies to be printed.

Let's try that again. If a number greater than zero was entered, the comparison result will be invalid, an error will be generated, and the **PGO QUIT** instruction will be ignored. Sounds like the long way around, but it works.

This action will allow the **PSX** command to be executed, assigning the number in \$A to the variable X.

Lines ten through thirteen of the program operate as before. The invitation is loaded, and the first copy is printed.

In line fourteen, X is again decremented to account for the first copy being printed.

The next two lines (fifteen and sixteen) are used to determine if more than one copy was desired. If a number greater than one was entered, no error will be generated when X is decremented in line fourteen. This will cause the program to branch (**PGO LOOP**) to the label LOOP.

If the number "1" was entered, an error will be generated when X is decremented in line fourteen. This will cause the **PGO LOOP** instruction to be ignored, and the **PGO QUIT** command will be executed.

The rest of the program will execute as did our previous WPL program, PRINT.5.

### Choose Your File

So far, so good. The last example will allow you to specify how many copies of the invitation you wish to print.

If we make just one more change to the program, we will be able to load any file we wish, and print as many copies as desired.

Once again, clear memory and load the last WPL program. Make the following modifications, name it "YOUR.CHOICE", and save on disk. This will be our last accomplishment for this article.

### WPL Program: YOUR.CHOICE

#### INITIALIZE

PND

NY

PPR<Backslash>

#### GETNAME

PPR

PIN Name and Location of file: =\$B

PCS/\$B//

PGO QUIT

PPR

PPR

#### GETNUMBER

PIN How many copies? =\$A

PCS/\$A/0/

PGO QUIT

PSX \$A

#### LOAD

L \$B

#### PRINT

PNP

PSX - 1

PGO LOOP

PGO QUIT

#### LOOP

PCP

PSX - 1

PGO LOOP

#### QUIT

PQT

We have inserted a new routine ("GETNAME") into the WPL program. This routine will print a blank line (PPR). It will display the message "Name and Location of file: ", and wait for a file name to be entered. The name that is entered will be assigned to another variable, \$B.

Again, we will use the PCS command. This time, we will compare the information in \$B with "nothing", to see if the «RETURN» key was pressed without a name being entered. To compare \$B with "nothing" (or a null string), make sure there is no space between the second and third slashes.

If the «RETURN» key was pressed with no name being entered, the result of the comparison will be valid, and the **PGO QUIT** command will be executed.

If a name was entered, the result of the comparison will be invalid, an error will be generated, and the **PGO QUIT** command will be ignored.

This does not mean the program will operate correctly if you enter an illegal file name or location. If you do this, when the

WPL program attempts to load the file, a system error will be produced, and the WPL program will terminate.

After the completing of the comparison test, control will pass to the following command (PPR), which will print a blank line. The next command (another PPR) will be executed, and the program will resume with GETNUMBER.

The number of copies to be printed is determined in the routine named GETNUMBER. This is the same routine used in our last program.

The routine named LOAD will load the file name you assigned to \$B into memory.

The rest of the program will print the desired number of copies, and terminate the program.

Now you have a small, general purpose WPL program that will allow you to load and print as many copies of a file as you need.

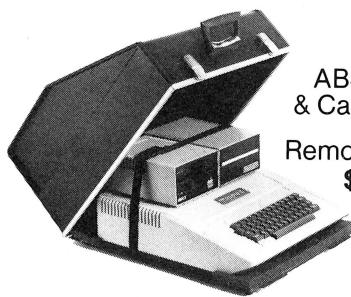
In this first article, the structure of a WPL program, the basic commands, and the flow of control have been examined. With some thought, a little work, and a dash of creativity thrown in, you should be able to modify these samples to perform some more useful tasks.

In our next article, we'll move on to more advanced techniques that will allow letters to be personalized, printing of multiple files, and some other interesting features.

Before we're finished, we'll write a WPL program that will create and maintain a mailing list, do automatic insertion, and who knows what.



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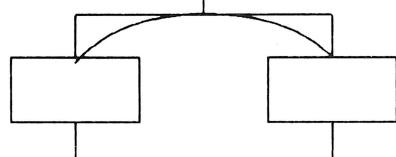
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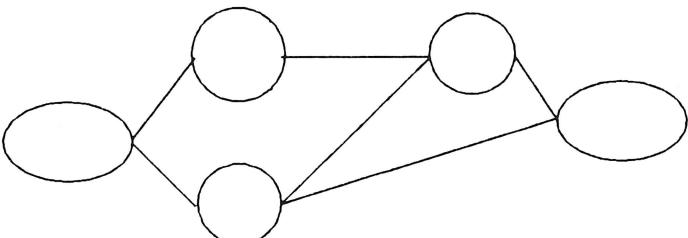


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# Data Management

by *Malcolm Slovin*

**M**anaging your data is not the easy task many software vendors would have you believe. Software ads for "database" systems attempt to impress you with their easy data entry methods, fast sorting and searching routines and flexible reporting formats. These ads conjure up visions of days of leisure while your new computerized filing system works unceasingly (and certainly flawlessly) to keep your business organized and profitable. In point of fact, much thought, effort and learning are required before a "database" system will perform as an integrated part of your business.

What we'll do here is to begin exploration of the area of "database" systems, and provide information and examples on choosing and using these software systems in your business. As a first step it is important to understand what a "database" system is and a bit of how they work. In future articles I hope to provide some reviews of current software and world business examples of their use and abuse.

Much of this information is derived from the activities of the International Apple Core's Data Management Special Interest Group, a group which concentrates on the various software packages available for filing systems, data base systems and possibly, data analysis systems. The SIG's interest is not only in what these packages are capable of doing but also in how they accomplish the data management task. This includes factors such as storage device formatting, virtual memory usage, types of storage files created and print facilities.

As a starting point let's divide a computer system into two areas: the computer itself, and the storage devices. Systems software (in whatever form) controls the movement and interaction of data within and between both areas. At this level we are concerned with the management of data by those utilities and programs that directly control the operation of the computer system. It is therefore important to look closely both at operating systems and data management utilities.

## What's a Database?

The term "database" has been used to cover everything from simple filing systems to program generators. In a simple filing system, data items are stored in records and the records are stored in some organized fashion in a file. This is similar to the common filing cabinet kept by most homes and businesses. One file cabinet might contain all of the information about each of our customers, and each paper file folder would represent an individual customer. The information in each customer's folder represents data items which are usually entered next to the appropriate field name in the folder. The name of John Doe appears in the NAME field and his address appears in the

ADDRESS field. (He also happens to manufacture Widgets which appears in the PRODUCT TYPE field).

In a computer filing system of this type, one made up of similar or the same types of records, the records form a flat file or data file. Programs are then written to allow you to access these records, and the data items they contain, so that you can add, update (or change), delete and report on the information contained in the filing system. In the "good old days" (five to ten years ago) programs were written specifically to access that particular file and its contents. If you developed a new file then a new set of programs had to be written to perform the same set of functions for this new set of information.

Fortunately, programmers got tired of "re-inventing the wheel". This gave rise to the type of filing system available today. A set of programs are developed, each of which performs a specific function such as Add Data to The Record, Delete Data, Add A Record, Delete A Record, etc. These "routines" can be used to access information contained in several different files, although only one file can be accessed at a time. If you want to add data to your Customer file you must first finish with your Accounts Due file and put it away before opening your Customer file. You cannot easily combine data from both of these files for report, nor can you update both files simultaneously even if they both contain some of the same information.

Although the "routines" approach may seem superior to the specific program approach, you still lose something. A program written specifically for your application is a customized piece of software and as such can provide records tailored to your exact needs in an extremely efficient manner. However, routines cannot be easily customized. In essence, you may have to tailor your business requirements to the systems requirements if you want to use that software. For example, you may have a small paragraph which summarizes your customer's past dealings with you. In the custom system these paragraphs could be of any length while in the "routines" system there may be a requirement that no field (in this case the one called PAST DEALINGS) have a length greater than 256 characters. If you couldn't describe your customer's past history in 256 characters or less you'd be out of luck (and room).

Most of the systems on the market today are variations on the "routines" type of filing system, although for obvious reasons many businesses are going back to having custom systems developed for them (just like in the old days). If you can use a simple filing system it is important that you determine the limitations of the system before you purchase it so that it meets most or all of your needs. Don't trust the package blurb to "tell it

like it is". One way to find out about any software system is to call the company that produces or markets the product and ask for the names and numbers of two or three references. Then *call them!!* In addition, ask the sales people of your local computer store to refer you to others who have purchased the package.

Data files in general have several drawbacks. First, you are bound to have redundant data in several of your files. How many times are you going to have to repeat John Doe's name? If you have a customer record for him, his name will appear there, and if you have an accounts due record for him, his name is likely to appear there too. If his name, address, or anything else changes, then you must be sure to change it in both places or you're going to have some interesting creative financing for John Doe's accounts. The problem of Data Redundancy can lead to the second problem - that of Data Integrity (the creative financing referred to above). Inconsistencies among data files can cause incredible problems in a business, not to mention loss of money.

## The DBMS

These problems and others have led to the development of sophisticated DataBase Management Systems (DBMS) which provide for the integration of data files into a database and the orderly management of the data by generalized software routines. In a DBMS it is not only important to define what data is to be stored, but also how it should be stored. It is important to define the relationships between the files and/or data and then choose the proper type of DBMS.

Three general types of database structures are possible (with variations on the theme): Relational, Hierarchical and Networked. Each of these database structures has something to offer the user which is different than either of the other two. In general, however, using one of these database structures and the systems necessary to access them (hence the term Database Management System) will provide you with some important functions usually not available with simple filing systems. These are: minimal or no data redundancy, increased consistency of information, increased data security, development of data independent application programs, and centralized data control. However, database systems are not the rose garden many expect them to be. Having a centralized data location can make the system a convenient target for destruction. In addition, an integrated data system could easily result in loss of responsibility for data accuracy. Who updates the NAME and ADDRESS fields and who is responsible for the PRODUCT TYPE field? These drawbacks can make a centralized database system unsuitable for a small business environment.

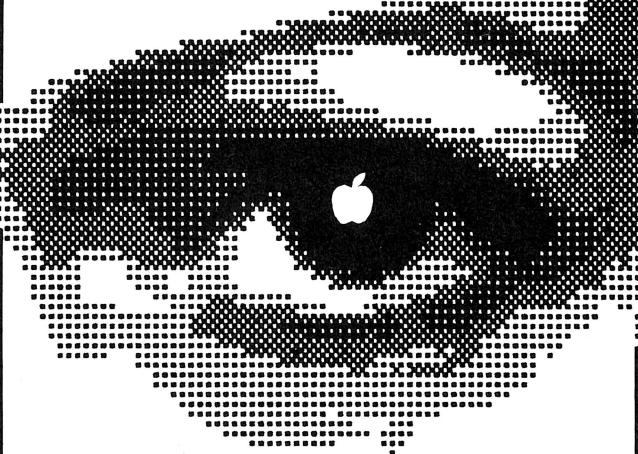
It should be obvious that automating your filing reporting functions can require more than a simple reading of the ads. In future articles and in activities of the Data Management Special Interest Group of the International Apple Core, we will explore the various database structures and the systems that access them and attempt to point out how they might be of use to you and your business.

If you would like to join us, please write. My address is:

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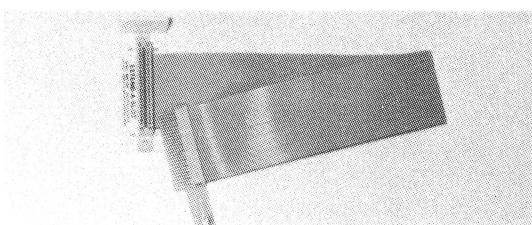


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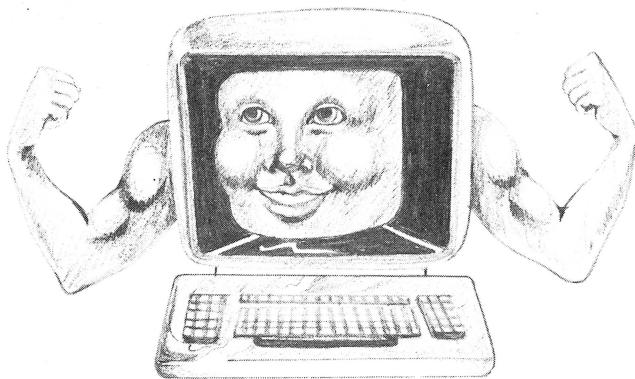
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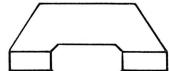
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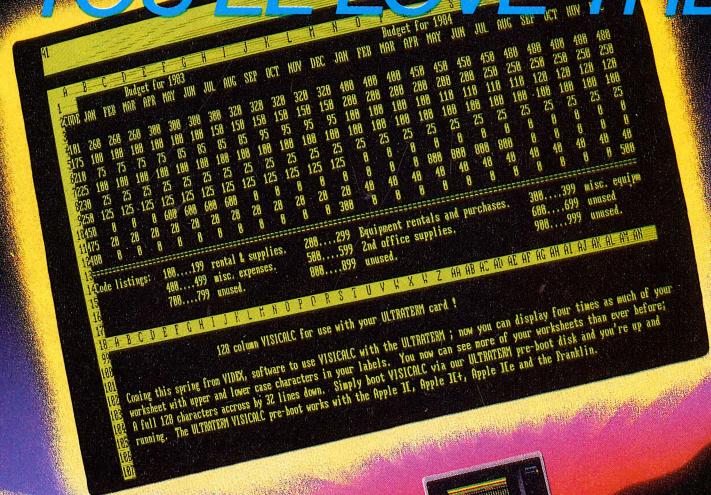
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# Plot and Counterplot

by Peter C. Weiglin

**H**ewlett-Packard's Model 7470A two-pen plotter has a new big brother: the 6-pen Model 7475A, which lists for \$1,895.

Meanwhile, H-P has also announced a 30 per cent price reduction on its Model 7470A, from \$1,575 to \$1,095, and new film for overhead transparencies.

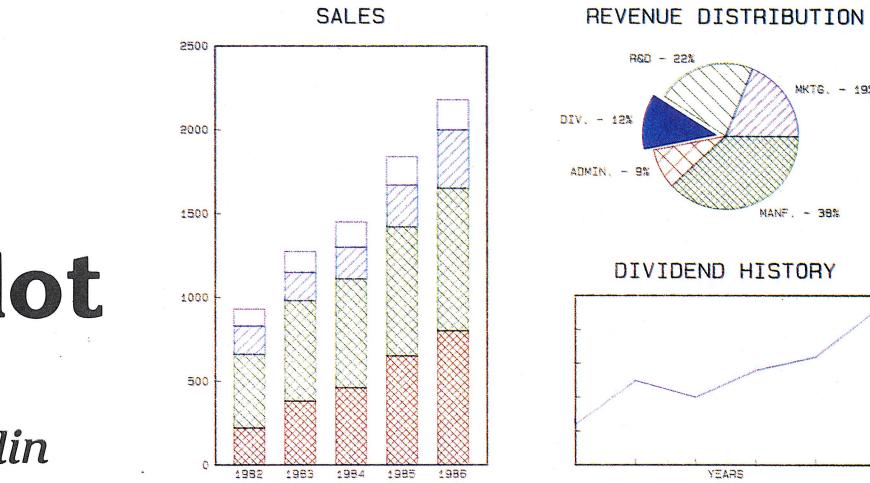
The picture at the left and the sample graph save much space in describing the Hi-Res capability of the 7475A plotter.

The 7475A contains a carousel containing six pens from which the plotter may select (software or panel controls) during a plotting operation; the 7470A carries two pens. In terms of drawing size, the 7470 is limited to ANSI "A" size drawings (8 1/2 x 11"). The 7475A can work on these and ANSI "B" size drawings as well (11 x 17").

Both plotters also handle overhead transparency film, and H-P also announced a new film that dries in 30 seconds, rather than the old ten minutes.

Both plotters use essentially the same pen transport mechanism; H-P is deservedly proud of its DC servomotor drive (not stepper motors), which allows them to claim a .001" resolution and pen speeds up to 15 inches per second. Another nice feature: when a pen is returned to the carousel, a cap moves up to cover the point and retard the drying-out process.

The plotters are available with one or the other (but not both) of two interfaces: RS-232C or HP-1B, which is H-P's version of IEEE 488.



It seems clear that H-P is aiming the 7475A toward business users; six pens on-line would, for example, provide three colors in each of two available line widths, or six colors, or any combination. The 7470A becomes an even more "personal" plotter at its new price, for those who don't mind changing pens in mid-plot if necessary.

The plotters work with a wide range of graphics software. A list of software packages for the Apple //e and //I with which either the 7470A or 7475A, or both, are compatible, includes Apple Business Graphics™, Chart-Master™, Graph'n'Calc™, GraphPower™, and pfs®:GRAPH. Craig Schmidt, H-P's Product Marketing Manager for these two plotters, explained that, as usual, the first list is already outdated. A number of firms have been working with H-P to

allow their software to work with the 7475A, and more announcements are forthcoming.

For those who do their own programming, the 7475A contains more than 50 Hewlett-Packard Graphics Language (HP-GL) commands covering pen movement, character selection, area fill and scaling.

#### New Apple Plotter

Apple Computer, meanwhile, has announced its Model 410 four-pen Color Plotter, which will accommodate B-size drawings, has an .004-inch resolution, and will sell for \$995. The plotting speed is about one-quarter as fast as the Hewlett-Packard units. Apple is apparently using the Yokogawa Electric Works (YEW) PL-1000 mechanism with some Apple-modified electronics.



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# The Incredible Jack

*Review by Barry D. Bayer*

Published by:

Business Solutions Inc.

Machine: Apple II, II Plus (with 64K), //e

Language: Run Time Pascal

Price: \$179.00 (\$20 for backup disk, \$30 per year for telephone customer support)

**T**he *Incredible Jack* purports to be a "Jack-of-all-trades" which combines word processing, calculating and record filing functions into one integrated program with a single set of commands, all dealing with a single file. And in one small sense it does that. A representative of the publisher told me that *Jack* was designed for educators and beginning //e users. It might be adequate for that audience. But if you read the advertisements or the articles, you may have concluded that *Jack* is the Apple // answer to *Lisa* or *1-2-3* or *VisiON*. Well don't throw away your *VisiCalc*, *DBMaster* and *Applewriter* just yet. Because while *Jack* performs all of these functions after a fashion, it doesn't do any of them in a way that will satisfy the journeyman Apple user. Let's take a look at the details.

*Jack* comes packed in one of those \$3.00 plastic cases which can hold 10 mini-floppies, together with a 125 page 5-inch square manual. The manual is divided about half and half between tutorial and reference guide. The manual is informative as far as it goes, but the publisher's spokesman told me that *Jack* was so powerful that the manual documented only about one third of *Jack*'s capabilities. (I'm not sure why, but he seemed rather proud of this.)

## Description

*Jack* is a run time Pascal package with all of the pluses and minuses that implies. If you don't have an 80 column card, you can utilize 80 columns with Pascal's Control-A, Control-Z arrangement, and can show upper case in reverse video, with lower case in regular capitals. The standard shift key modification for the Apple II is recognized, and Control-E will change cases if your shift key won't. Non-standard interface cards such as the Mountain Computer CPS Multi-function card will not work unless you fiddle with the BIOS in some way, but you CPS card users are undoubtedly familiar with such problems and know how to solve them. And of course, *Jack* will not read normal DOS files, nor will it generate files readable by a DOS based program. (Of course, Pascal/DOS transfer programs HUFFIN and PUFFIN will solve some of these problems for you.) The publisher claims that the program takes advantage of the //e's new features. As I reviewed *Jack* on a II, however, I couldn't say.

## Use

Boot the disk, and you are eventually presented with an across-the-top of the screen menu that, in typical Pascal menu style, can be accessed with the first letter of Disk, File, Select, or Print. (In typical Bayer fashion I found myself hitting the wrong key from time to time, but I was always able to back out to the main menu

without disturbing anything. I used to have that problem with Pascal, also, but got used to it. I assume I'd get used to *Jack* after a while, also.) The D option leads to a display of file names present on the data disk (by the way, you really need a minimum of two disk drives to use the program effectively). Simply move the cursor to the appropriate file name, and hit the Load option on the new menu that has suddenly appeared, and the file of your choice will be "loaded". If you want to start a new file, enter a name and load it. This step is important, because although *Jack* will let you work on an unnamed file, you won't be able to save it, print it, or do anything else with it.

To use the "word processing" portion of *Jack*, simply "Preset" left and right margins, if applicable, and start typing. *Jack* does an automatic word wrap when you get to the end of the line, and what you see is what you get. When you are finished typing you can Save the file, or move to the Print mode, and print the file. If you change your mind, you can overstrike any portion of the text, insert, delete, and copy a word or phrase in one section to another section. However *Jack* is missing Search and Replace and many of the other features of the modern word processor. I wouldn't want to type this review using *Jack*. But if I had a bunch of individualized form letters, I might use *Jack*. Which bring us to the information manager portion of the program, using a mailing list as an example.

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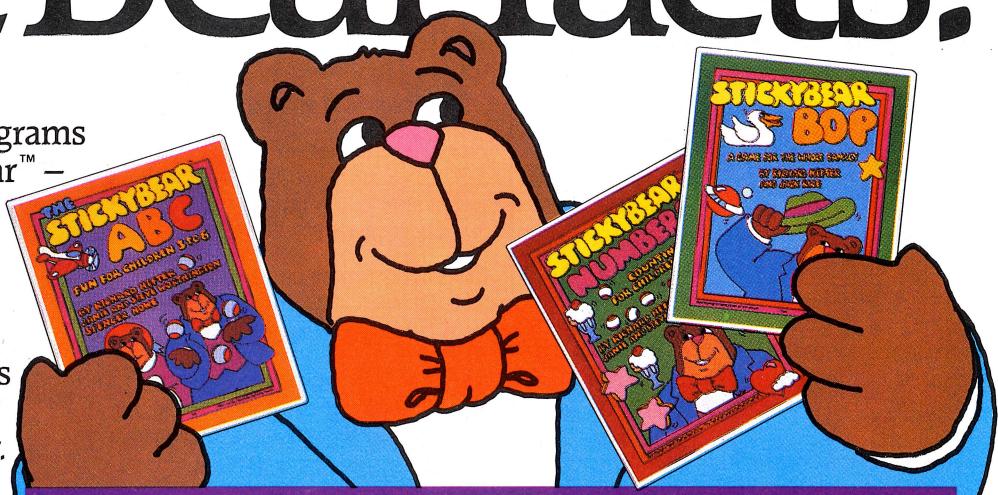
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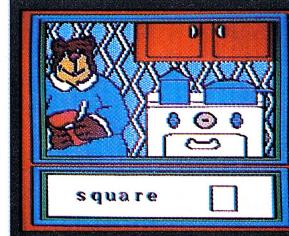


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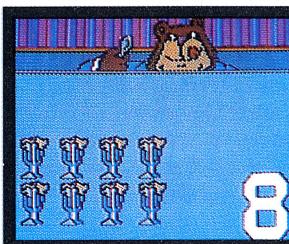
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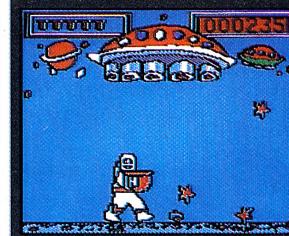
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Enter a colon (":") and a caret (^) with some number of spaces (The default setting is 10 spaces.). The distance between the colon and the caret is considered a field. Position the cursor somewhere within the field, press a Control-F, and the cursor will jump down to the "Footnote" area of the screen which looks something like:

#01:

Had there been text of some sort immediately to the left of the colon on the text page, that text will be associated as the name of the field on the Footnote page. Thus if instead of typing just a colon, you had typed "Dear:", the Footnote area of the page would now show:

DEAR:

Jack is now asking you to enter a rule of some sort which will tell it how to deal with the field called #01, or DEAR. This "rule" could be a local format for the entries that will be made in that Field, or a Formula of some sort, or even a constant. In this case, we might want to leave the Footnote blank, because we want to pick the DEAR names off of a mailing list. As a matter of fact, because the name we want to insert into DEAR will be associated with a field named FIRST.NAME in the mailing list file, we should also go back into the Footnote, and overstrike DEAR, and change it to FIRST.NAME. Other fields of the Addressbook file might be included, so that each addressee's city could be within the body of the letter. Again, the place in the form letter where the city is desired would be indicated with a colon and a caret and would be "named" within the Footnote, with the same name as the field in the Addressbook file.

Now Addressbook would be "copied" into the form letter, and all of the information contained in fields with a common name between the two files would be copied from the one to the other. Fields in Addressbook which did not have counterparts in the form letter would be ignored. Formletter (actually, one formletter for each name in Addressbook) would be printed.

Printing has a page of parameters which is shown in Figure 1. Any of these may be changed. When the parameters are properly set, Jack will print out each record, each on the top of a new page.

A Jack page can take a different form, because a Footnote can also contain a "calc" rule. You can define a field

RETAIL

and a field called

DISCOUNT:

DISCOUNT can be associated with a Footnote which says

.35 \* RETAIL

Finally, a field called

WHOLESALE:

can be defined as

RETAIL - DISCOUNT

Place a number in RETAIL and the DISCOUNT and WHOLESALE price will appear. This is the basis of Jack's claim to be a calculator.

Calculating rules can be more complicated. DISCOUNT, for example, could have a rule which says

```
IF RETAIL > 1000 THEN .6 * RETAIL
ELSE IF RETAIL > 500 THEN .5% * RETAIL
ELSE IF RETAIL < 100 THEN .7 * RETAIL
ELSE .75 * RETAIL
```

It is important to note, however, that Jack is not VisiCalc. A Business Solutions spokesman agreed with me by telephone that Jack does not do a very good job on "Row and Column" type Templates. A major reason is the lack of a Replicate command. Calc users know that one of the most important parts of a spreadsheet program is the ability to enter a command which says this month is just like last month. And so on for the rest of the year. If you wanted to do something like that with Jack you would have to enter twelve Footnotes (which could be done without retying with the "copy" command) and then change the reference names in each command to refer to the correct previous rule. This is not something that you will wish to do very often.

We have touched upon the information manager section of Jack, and by now you will not be surprised to find that a file format can be set up by entering a field name, a colon, and then adjusting the caret the appropriate number of spaces to the right of the colon. Jack apparently maintains a table of some sort of one field per record for sorting and selecting purposes. This primary field is the first one to be designed into the record. This is not necessarily the first field physically appearing in the file. Thus it is possible to keep the primary sort by zipcode, yet have the last name appear as the first field in each record. Editing a form is as simple as editing a letter. What you see is what you get. And, of course, calculated fields may be included as part of the form, simply by entering a "rule". In Jack's favor, setting up an entry form for an Addressbook type file, as shown in Figure 2, took about 3 minutes.

Once the form is set up, the format should be "Locked" and "Saved", and is then ready for data entry. You can tab from field to field, entering data as appropriate, then "save" the record to disk, and move to enter the next record. Ninety names (or presumably 190 names) go into the address book very quickly.

One can "select" to find a record containing particular information within any field. The process is as easy as entering a Footnote, equating the field name with some particular contents. Thus

LAST.NAME = "BAYER"

would find all records which have the name BAYER as a last name. (Watch upper/lower case, though, because Jack does not recognize "BAYER" and "Bayer" as the same string.) If LAST.NAME was the first field entered into the form, Jack will find the selected records fairly quickly. If not, Jack will have to read through each record to see if LAST.NAME = "BAYER" and this could take quite a while.

But although I expect to find all of the information in Addressbook useful eventually, for my own purposes, I would like to have a list with last name, first name, area code, and phone number on a line, fifty lines to a page with appropriate headers and footers. A pretty standard report printout.

The first thing to do is to set up another file, which I'll call PHONELIST, with the field names FIRST.NAME, LAST.NAME, A.CODE and PHONE. Note that these names are the same field names used in Addressbook. Now copy Addressbook to Phonelist; Jack will read each record in Addressbook, and transfer the information in the four indicated fields in the appropriate fields in Phonelist. If Addressbook has 93 records, Phonelist will also have 93 records.

Now to print out the list, in alphabetical order, (with my cousin Andrew, brother Charlie, niece Emily, all with the same last name in Andrew-Charlie-Emily order), 50 to the page. Now I happen to think that this is a perfectly ordinary request to make of Jack. Unfortunately, Jack can't do it.

Jack can sort on any given field, but cannot do a secondary sort. All of the Bayers will be together, but Jack doesn't really have a way to make sure that Charlie will appear after Andrew and before Emily. Second, Jack wants to start each record on the top of a new page. One record, at least one page. Of course, that's not what I want. Business Solutions suggested that one way to solve the problem would be to cheat, telling Jack that each page was only one line long.

```

WIDTH(255): 80      LENGTH: 66
SPACING: 1          LEFT OFFEST: 0
FILL(Y/N): Y        FLUSH-RIGHT(Y/N): Y
COLON(B/D/:): :    CARET(B/D/^):^

TOP SKIP: 2          BOTTOM SKIP: 3
TOP TITLE:
BOT TITLE:

FOOTNTES(Y/N/E): N

LINEFEED(Y/N): Y    CONTINUOUS(Y/N): N
MESSAGE:

SORT:
ALPHA SORT(Y/N): Y

```

Figure 1

```

LAST.NAME:
FIRST.NAME:
COMPANY:
ADDRESS:
CITY:
STATE: ^ZIP:      ^ AREA.CODE:      ^
PHONE NUMBER:     ^ STATUS:        ^
OTHER.NUMBER:     ^

```

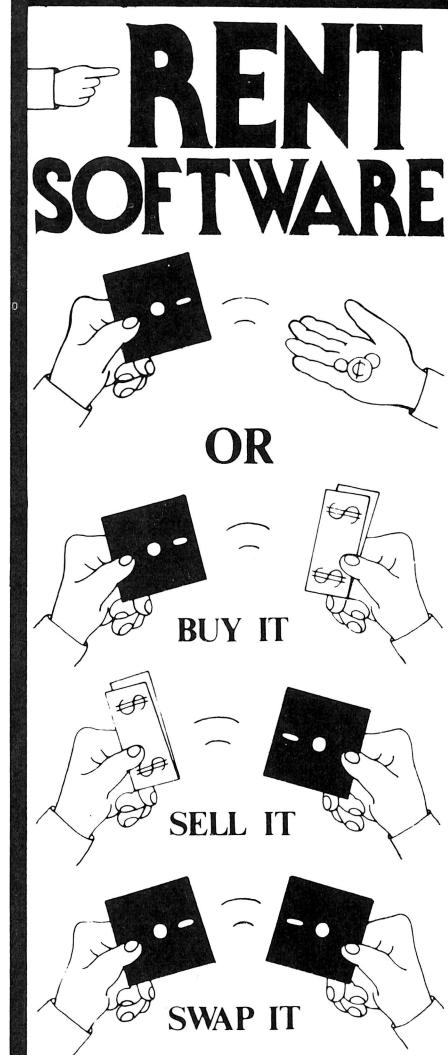
Figure 2

That sort of works, but then *Jack* won't give me headers and footers, and page breaks every 60 lines, where I would like to see them. A Business Solutions representative acknowledged that *Jack* was a little weak on report formatting. While half a loaf is better than none, half a file manager isn't much use at all.

I was able to get my questions about *Jack* answered by calling the company. However, the manual notes that a special telephone "hotline" service is available to registered owners for a fee of \$30 per year. I am not saying that Business Solutions won't talk to you if you haven't paid your \$30, but the manual does suggest writing for answers, and Business Solutions' phone number is nowhere to be found in the manual. I consider Business Solutions' policy a bit strange, particularly after the company's statement that the manual documents only a third of the capabilities of the program. I think the prospective purchaser should consider not only the \$129.95 purchase price but also the \$30 per year hotline fee, as well as the \$20 backup fee in determining whether to purchase the product. (To be fair, I received a coupon good for \$15 off the backup copy fee, but I have no idea whether this is a permanent policy of Business Solutions, as the manual makes no reference to it.)

*The Incredible Jack* is somewhat of an enigma. Business Solutions has presented a nice looking package with convenient user interface, and which could be of real service to a purchaser. The file manager record format setup is the easiest that I have ever seen. Reorganization of file structure is not the problem that it seems to be with some programs, and form letters with calculated fields work about as easily as any other program I've used for the purpose. But because of the inability to do a secondary sort, and the requirement that each record start on the top of a page, decent summary reports are next to impossible to generate. And as far as I was able to determine from the company, no plans are being made to make changes that would solve the problem.

But the biggest problem with *Jack* is that it is not, as it has been hyped, a do-it-all calc/word processor/file manager. I would think that anyone who buys *Jack* with all three functions in mind will be sorely disappointed. Should Business Solutions figure out how to let the program sort and report, however, the prospective purchaser who wishes an easy to use modest information manager, with a "user friendly" form letter interface could do a lot worse.



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by Joe and Chris Jasper

*(We present here a program the use of which should be made mandatory for all teenagers and politicians. Particularly politicians. Most particularly legislators. Or, maybe if enough voters were familiar with the concepts shown by this program, they would be less susceptible to the rhetoric that clouds sound economic thinking.—PCW)*

**M**OST OF US, while thinking about our financial future, have wondered: "What if—?" What if I left my present job and started my own business or retired early; would my savings (and pension) last as long as I hope they will, or should I wait a few more years? Or, what if I invest some of our savings in a new company with "outstanding potential", and it succeeded - or failed? What if—?

In situations like this, a most important consideration is the amount of money available (both now and in the future) to live on, to invest, to keep in savings, and so forth - in effect, your personal resources. How these resources are used, or misused, can have a substantial effect on your future plans. This program can show the results of various decisions on those resources: what will happen with an increase or decrease in savings, salary, expenses, interest rates and inflation.

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This program allows entry of your present savings or cash-on-hand balance (current resources) plus your present salary or other income, and your anticipated expenses for the year. Your savings balance increases by an estimated interest rate, while your salary and expenses increase by an estimated cost-of-living, or inflation rate. The individual entries and interest/inflation rates can be changed as circumstances change, or can progress at the rates entered earlier.

An example of a typical projection demonstrating what this program can do, is shown in Figure 1, and is calculated as follows:

1. The original entries are made for the year beginning in 1982.
2. Before the 1983 entries are displayed:
  - a. Your original \$10,000 savings balance is increased by the interest rate (8%) to \$10,800.

b. A cost-of-living raise increased your \$20,000 salary by the inflation rate (5%) to \$21,000; unfortunately, that same cost-of-living increased your expenses by 5% to \$26,250. ("What one hand giveth . . .")

c. The entry math section of the program (Lines 300-350) added the increased savings balance and salary together, and subtracted the increased expenses to obtain the new savings balance ( $\$31,800 - \$26,250 = \$5,500$ ).

3. The newly increased balances are displayed for the beginning of 1983, and if the RETURN button is pressed the process is repeated for 1984. NOTE: To keep the program simple, it is assumed that any money left over at the end of a year is deposited in the savings balance, forming part of the "resources" for the next year.

---

FOR THE YEAR BEGINNING IN: 1982

ESTIMATED SAVINGS BALANCE: \$ 10000

EXPECTED SALARY/OTHER INCOME: \$ 20000

ESTIMATED YEARLY EXPENSES: \$ 25000

EST SAVINGS INT RATE: 8%

EST INFLATION RATE: 5%

---

FOR THE YEAR BEGINNING IN: 1983

ESTIMATED SAVINGS BALANCE: \$ 5550

EXPECTED SALARY/OTHER INCOME: \$ 21000

ESTIMATED YEARLY EXPENSES: \$ 26250

EST SAVINGS INT RATE: 8%

EST INFLATION RATE: 5%

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FOR THE YEAR BEGINNING IN: 1984  
ESTIMATED SAVINGS BALANCE: \$ 481  
EXPECTED SALARY/OTHER INCOME: \$ 22050  
ESTIMATED YEARLY EXPENSES: \$ 27562  
EST SAVINGS INT RATE: 8%  
EST INFLATION RATE: 5%

Figure 1

Some good news in 1985: you receive a New Year's Day gift of \$10,000 from a rich uncle (just in time!), and with this money burning a hole in your pocket, you want to make a \$5,000 down payment on a new car the next day. (Is this a wise thing to do? Let's see.)

Press the space bar to move to the entry changing section of the program, and enter next year's date (1985), the new savings balance of \$10,481 (you'll have to do the addition of the new money yourself), and the revised expenses of \$32,562 (last year's expenses plus the down payment on the new car.) The revised entries will be displayed as before (see Figure 2). Press «RETURN» to see how you'll fare in 1986. Oh, oh—your estimated savings are down to \$281, and you haven't taken car payments into account. To avoid running out of money in 1986, you'll have to get a better job or cut down on your expenses.

FOR THE YEAR BEGINNING IN: 1985  
ESTIMATED SAVINGS BALANCE: \$ 10481  
EXPECTED SALARY/OTHER INCOME: \$ 22050  
ESTIMATED YEARLY EXPENSES: \$ 32562  
EST SAVINGS INT RATE: 8%  
EST INFLATION RATE: 5%

FOR THE YEAR BEGINNING IN: 1986  
ESTIMATED SAVINGS BALANCE: \$ 281  
EXPECTED SALARY/OTHER INCOME: \$ 23152  
ESTIMATED YEARLY EXPENSES: \$ 34190  
EST SAVINGS INT RATE: 8%  
EST INFLATION RATE: 5%

Figure 2

This somewhat frivolous example showed what your resource trend is: in this case, not good. Perhaps if you had not spent so much on a new car, or had found (and kept) a higher paying job, and/or had managed to cut your expenses, your resources would have been rising instead of falling. In any case, by repeating the projections with different values for the various

entries, you can get a reasonable approximation of what income will be required for a specific goal: putting a son or daughter through college, a new car, a globe-spanning vacation, retirement, or all of these!

### Program Operation

Lines 100 - 130: Provide the original value entry points for the beginning year (DT), saving balance at the start of the projection (SB), salary or other income that can be expected for the coming year (SY), expenses or situations that could reduce your resources (EX). The saving interest rate (A) and the inflation rate (B) have an important effect on the projection, especially at rates over 8 - 10%, so make your best estimate of what they are likely to be in the years ahead.

Lines 200 - 260: Display the entry values, and provide the opportunity for changing an incorrect entry, or updating an entry for the next year to reflect a change in your financial situation. NOTE: If your printer interface card is in a slot other than #4, change Line 205 and 335 accordingly. PR#0 (Line 240) turns the printer off after recording the displayed entry values.

Lines 300 - 350: Provide the math functions for the program. Line 300 advances the entry date by one year. Lines 305 - 315 increase the respective entries by the amount of the interest/inflation rates associated with that entry. Line 320 adds the new saving balance value to the salary/other income entry and subtracts expenses to obtain the year end value for the savings (resource) balance. As long as the savings balance is at least one dollar at year end (not much, but something), the yearly displays and calculations can continue if the «RETURN» key is pressed to show another year. If your projected expenses reduce your resources below the point where your income cannot keep up, and your resources will fall below one dollar before the next year's totals are displayed. Lines 330 and 335 signal an end to that set of values and request that you enter new values for another projection.

Lines 400 - 475: This is the entry change section. It is similar to the initial entry section (Lines 100-130) but is structured differently to allow you to retain an existing entry (by pressing the «RETURN» key), or to change an entry (by pressing the space bar). NOTE: If you are planning to change an entry for the following year, be sure to change the date, as the jump to the entry change section by-passed the date changer on Line 300.

### Program Notes

1. CHR\$(13) is the ASCII code equivalent of the «RETURN» key. For example: Line 250 waits for a keyboard entry. If the «RETURN» key is pressed, ASCII code CHR\$(13) is generated which causes the program to jump to Line 300 where the math functions for the next projection begin. If a key other than «RETURN» is pressed, the program jumps to Line 400 and the changing entry section. (Actually almost any key other than «RETURN» could be pressed to jump to Line 400, but the space bar was chosen for its accessibility.)
2. The displayed entries for the savings (resource) balance, salary/other income, and expenses, do not show a decimal fraction; this is to increase the clarity of the display. The decimal fraction is retained in the computer memory, however, for use in future calculations. Since the values are estimates anyway, the display will still be valid within one dollar, which is close enough for the purpose.
3. If your expenses and income vary from month to month as they do for almost everyone, an article by this author in a

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previous issue of **Apple Orchard** titled: "A Running Average Program" provides a means of averaging many months or years of varying income and expenses, to show a trend line whose projected values can be used as entries for this program.

4. By entering zeros for salary, expenses, and inflation, and a value such as \$1,000 for the savings balance, you can see the effects of different rates of savings account interest. Or do the same with your salary or expenses and an inflation rate of say 5%. The result, especially after several years have passed, can be staggering.
5. The savings balance entry is a "catch-all" for any resources remaining at the end of each year. If you choose to keep your "left-overs" in cash or some other non-interest earning form, enter 0% for the savings interest rate. If some of your resources earn interest and others do not, enter a proportionate rate for the total value.
6. Because this program does not calculate your income tax and deductions, your salary/other income entry should be entered as take-home salary/other income after taxes. Indeed, *all* the entries and calculations are "ex-tax" and should be considered as such.
7. Instead of entering a *specific* year, you might enter a "1" for the initial year, to see the effect after a given number of years - for example: 5, 10, or 15 years later.
8. We hope that all your close-to-true-life projections will result in a growth in your personal resources, and not display the "dreaded" appearance of Line 335 on your monitor screen: RESOURCES ZERO BEFORE END OF 1986!

### Listing 1

```

1  REM ****
2  REM * PERSONAL RESOURCE *
3  REM * PROJECTION *
4  REM * BY *
5  REM * JOE & CHRIS JASPER *
6  REM * COPYRIGHT 1983 *
7  REM ****
8  REM
9  REM
100 HOME : VTAB 3: HTAB 5: PRINT
    "PERSONAL RESOURCE PROJEKTION": PRINT : PRINT
105 INPUT "BEGINNING YEAR (EX:19
82): ";DT: PRINT : PRINT
110 INPUT "ESTIMATED SAVINGS BAL
ANCE: $ ";SB: PRINT : PRINT
115 INPUT "EST SALARY/OTHER INCO
ME: $ ";SY: PRINT : PRINT
120 INPUT "ESTIMATED YEARLY EXP
ENSES: $ ";EX: PRINT : PRINT
125 INPUT "EST SAVINGS INTEREST
RATE (%): ";A: PRINT : PRINT
130 INPUT "EST INFLATION RATE (%
): ";B: PRINT : PRINT
200 HOME : VTAB 5
205 PR# 4: PRINT "
210 PRINT "FOR THE YEAR BEGINNING
IN: ";DT: PRINT
215 PRINT "ESTIMATED SAVINGS BAL
ANCE: $ "; INT (SB): PRINT
220 PRINT "EXPECTED SALARY/OTHER
INCOME: $ "; INT (SY): PRINT

```

```

225 PRINT "ESTIMATED YEARLY EXPENSES: $ "; INT (EX): PRINT
230 PRINT "EST SAVINGS INT RATE: "
    ";A; "%": PRINT
235 PRINT "EST INFLATION RATE: "
    ";B; "%": PRINT : PRINT : PRINT
240 PR# 0
245 PRINT TAB( 5)"IF ENTRIES ARE OK:PRESS RETURN;": PRINT
250 PRINT TAB( 5)"TO CHANGE ENTRY:PRESS SPACE BAR": GET E$
255 IF E$ = CHR$ (13) THEN GOTO 300
260 IF E$ < > CHR$ (13) THEN GOTO 400
300 DT = DT + 1
305 SB = SB + (SB * (A / 100))
310 SY = SY + (SY * (B / 100))
315 EX = EX + (EX * (B / 100))
320 SB = (SB + SY) - EX
325 IF SB > = 1 THEN GOTO 200
330 PRINT CHR$ (7); CHR$ (7); CHR$ (7): REM CHR$ (7)=BEEP
335 PR# 4: INVERSE : PRINT TAB( 4)"RESOURCES ZERO BEFORE END
OF ";DT - 1;"": NORMAL
: PRINT : PR# 0
340 PRINT TAB( 5)"PRESS RETURN
TO ENTER NEW VALUES": GET N$
345 IF N$ = CHR$ (13) THEN GOTO 100
350 IF N$ < > CHR$ (13) THEN GOTO 340
400 HOME : VTAB 5
405 PRINT TAB( 5)"IF ENTRY IS 0
K: PRESS RETURN;": PRINT
410 PRINT TAB( 5)"TO CHANGE ENTRY:PRESS SPACE BAR": PRINT :
    PRINT
415 PRINT : PRINT "BEGINNING YEAR: ";DT: GET X$: IF X$ = CHR$ (13) THEN GOTO 425
420 INPUT DT: PRINT
425 PRINT : PRINT "SAVINGS BALANCE = $ ";SB: GET X$: IF X$ = CHR$ (13) THEN GOTO 435
430 INPUT SB: PRINT
435 PRINT : PRINT "EXPECTED SALARY = $ ";SY: GET X$: IF X$ = CHR$ (13) THEN GOTO 445
440 INPUT SY: PRINT
445 PRINT : PRINT "ESTIMATED EXPENSES = $ ";EX: GET X$: IF X$ = CHR$ (13) THEN GOTO 455
450 INPUT EX: PRINT
455 PRINT : PRINT "EST SAVINGS INTEREST RATE: ";A; "%": GET X$: IF X$ = CHR$ (13) THEN GOTO 465
460 INPUT A: PRINT
465 PRINT : PRINT "EST INFLATION RATE: ";B; "%": GET X$: IF X$ = CHR$ (13) THEN GOTO 475

```

```

470 INPUT B: PRINT
475 GOTO 200
499 END

```

Author's Note: While the preceding article was at Apple Orchard awaiting publication, a visiting computer consultant suggested an interesting programming change.

Lines 410-470 of the original program require that the space bar (or any key other than RETURN) be pressed to make an entry change. If you try to input a new value without pressing the space bar, the first number of the new entry will not be entered.

The suggested modification shown below (Listing 2) changes a revised entry to a value. This has the advantage of allowing the first and any succeeding numbers to be entered without having to press the space bar first. However, if some key other than a number is mistakenly pressed, the value entered will be zero.

An advantage of the original program, involving use of the space bar, is that if a non-number is entered, it will not be accepted, and the prompt "reenter" will appear on the screen.

But choose the version you like best, enter and save it, then run it.

#### Listing 2

```

410 PRINT TAB(5)"TO CHANGE ENT
RY:ENTER NEW VALUE": PRINT :
PRINT
415 PRINT : PRINT "BEGINNING YEA
R: ";DT: INPUT "";X$: IF X$ <
> "" THEN DT = VAL (X$)
420 PRINT
425 PRINT : PRINT "SAVINGS BALAN
CE = $ ";SB: INPUT "";X$: IF
X$ < > "" THEN SB = VAL (X
$)
430 PRINT
435 PRINT : PRINT "EXPECTED SALA
RY = $ ";SY: INPUT "";X$: IF
X$ < > "" THEN SY = VAL (X
$)
440 PRINT
445 PRINT : PRINT "ESTIMATED EXP
ENSES = $ ";EX: INPUT "";X$:
IF X$ < > "" THEN EX = VAL
(X$)
450 PRINT
455 PRINT : PRINT "EST SAVINGS I
NT RATE: ";A;"%": INPUT "";X
$: IF X$ < > "" THEN A = VAL
(X$)
460 PRINT
465 PRINT : PRINT "EST INFLATION
RATE: ";B;"%": INPUT "";X$:
IF X$ < > "" THEN B = VAL
(X$)
470 PRINT
475 GOTO 200
499 END

```



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# IAC Disks of the Month

*Review by Barry D. Bayer*

**B**ack in the early days of Integer BASIC, (that's the one with the '>' prompt) there were very few commercial programs available for the Apple II. Pioneer programmers, after developing a program of which they were particularly proud, wanted to share it with their fellow 10,000 or 20,000 Apple users. The easiest way to do this was to send the program to Apple, which took the best programs and distributed them free of charge to Apple dealers, who would let end users copy them for a small charge, or no charge at all. (Apple also seems to have hired many of the authors of these programs, but that's another story.)

As Apple Computer, Inc. got bigger, and commercial programs began to crowd each other off the dealers' shelves, contributed software, as an Apple Computer, Inc. function, fell by the wayside. But in the IAC, contributed software still lives.

One of the benefits enjoyed by an Apple Users Group belonging to the International Apple Core is the software, usually in the public domain and therefore legally copyable, usually distributed as the IAC Disk of the Month. DOMs become part of each member club's software library, and are distributed by most member clubs to their members at prices approximating the price of a quality blank disk. In addition, DOMs are available to individuals, and other non-members of the IAC, direct from the IAC at a cost of \$25 per disk plus \$3 per shipment for postage and handling. But we'd rather you join an IAC member club, instead, and get the programs on the DOM from your club. DOM programs mostly originate from members of our member clubs who are kind enough to share their work and ideas with the IAC's 400 plus member clubs.

DOM will be a regular feature in **Apple Orchard**, which will feature the most recent DOM available and, as these things go back a couple of years, an occasional "oldy but goody". We should note that DOMs do not contain, in the main, professional quality documenta-

tion and menus, and tend to crash, a bit, when presented with an unforeseen error. (We are told by the commercial software publishers that complete debugging of a program of any size takes thousands of man hours of work. While all programs are tested and are believed to be accurate, it is obvious that thousands of man hours have not been spent on debugging.) On the other hand, DOM programs are usually copyable, listable, alterable, improvable and generally contain understandable examples of "how to do it".

The March, 1983, DOM is a disk prepared by the IAC's Education Special Interest Group (SIG), and differs a bit from the usual. First of all, it was prepared with the assistance of ABC Software of Sacramento, California and Computer-Advanced Ideas of Berkeley, CA. Second, the disk is almost entirely in compiled Integer BASIC (using Chris Galfo's compiler), and is therefore not easily listable, alterable, etc. But it does have a number of well conceived programs which should find a place in any grade school classroom. Programmers noted on the disk include Tim Aaronson, Ted Cohn, Dave Daugherty, Andy Herzfeld, Ted Perry (our EdSIG chairman), Pete Rowe (of "Game Show" fame), Linda Slovick, Lawrence You, Geoff Zawolkow, and Barry Cole.

Boot the disk, and you will be presented with a distinctive high resolution graphics display which is almost worth the price of the disk. (I'm going to keep the topic secret, but the kids will love it.) Eventually you will get to a menu which will permit the running of nine programs.

**BOXES** tests for single digit addition and subtraction skills in a way that will please first and second graders.

**DRILL** is an addition/subtraction/multiplication/division quiz program which has delighted my 8 year old. The user chooses the operation to be tested, the level of difficulty, and the time to be permitted for each question. The program then relentlessly provides problem after problem in the form

$2 + 7 =$

and immediately marks the player's response as 'C' or 'X'. At the end of the series, the percentage of 'C' answers is given, and the player is offered the chance to exit or try another series. For children in the process of learning their number facts, a program like this is a necessity. ADRILL is just like DRILL, but adds the complication of signed numbers.

**APPLE BARREL** and **APPLE ARRAY** use the same graphics and story requesting the user to enter the number of apples that are harvested and placed into a barrel. In **APPLE ARRAY**, the Apples are stacked neatly into equal length rows, so that the program is, in reality, a clever multiplication test.

**FRED FRACTION** tests arithmetic manipulations of fractions, using a very clever animated graphics scene to draw the user into the program. Some teacher might not like the program's habit of accepting 13/12 in addition to 1 1/12, but the kids will love it.

**MAKING CHANGE** uses Hi-Res graphics representations of dollar bills, quarters, dimes, nickles and pennies, and quizzes the player with appropriate change problems. Some cashiers I know could use a bit of training with this.

**XZONE** is the last game on the disk. A 19 by 19 grid is presented. Using coordinates from 0,0 in the lower left, to 19,19 in the upper right, the player is invited to inspect the grid cell by cell, and determine where two secret (undisplayed) lines intersect. This will keep the older kids entranced for quite a while.

The final program on the disk is not a game, but a program which converts the Apple into a sort of oscilloscope, displaying the "voice print" of sound input into the Apple through the cassette input port. The instructions say it is for use in speech therapy, but it also presents some good clean fun.

Once again, DOM 24 is available from the IAC direct at a high outrageous price. But we'd rather you pick it up from your local Apple User Group.



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# The Machine Language Disk

## DOM #25

by Barry D. Bayer

**S**illy Question: "What is the most powerful language available for the Apple II?"  
Programmer's Answer: "Machine Language."

Now I am sure that most of you don't really believe the programmer's answer, but it seems to be true that you can do, in machine language, whatever can be done on the Apple in *any* programming language. In addition your machine language program would probably be more compact, and certainly run faster than anything you might do in BASIC, Forth, Pascal, or whatever else.

But machine language is difficult! You have to purchase expensive Assemblers to use it, and who can work in an environment where (10 - 1 = F)?

Well, DOM 25 to the rescue. Thanks to L.O.G.I.C., (the Loyal Ontario Group Interested in Computers; it's amazing what a little trademark tiff will drive people to) IAC Disk of the Month Number 25 gives the answers to 90 percent of what you ever wanted to know about machine language, but were afraid to ask. DOM 25 will not convert you to an accomplished machine language programmer overnight, but it will give you the tools necessary to begin work on a machine language level. And even if you never write a second machine language program in your life, (because Bruce Tognazinni will lead you by the hand in writing your first) you will gain new insight into those long listings that appear from time to time in the **Apple Orchard** and other magazines.

The first series of programs falls under the general heading of Binary Entry Utility, written by Kenneth S. Lind. (Binary entry is really a misnomer for Hexadecimal Entry, but why quibble?) Mr. Lind's programs make it easy to enter those strings of hexadecimal numbers that look like

100 - 01 2C EA 80 32 C5 A0 AD

Sure, you can do them directly from the monitor (you remember, CALL-151, and a \* prompt) without BEU, but if you've ever gotten lost in a multi-line listing, you'll appreciate it.

One step up from BEU is the Mini-Assembler program. You history buffs know that the Mini-Assembler originally resided in the original F8 Monitor, and could be accessed by typing F and

G with the *number of the beast* in between. (I can authoritatively report, however, that rumors that Woz invented FORTRAN using the Mini-Assembler are definitely untrue.)

Unfortunately, the Mini-Assembler never made it to the auto-start Monitor ROM. DOM 25 fills the void with a version which may be loaded into your Applesoft Apple II Plus, as well as instructions as to how to use it. In addition, Bruce Tognazinni takes you on a short tour of machine language programming, and shows you how to write a real live program. (Yes, you will actually write a machine language program before you're finished.) Hopefully, Bruce will enable you to overcome your "Fear of Monitor".

The Mini-Assembler, though often better than entering Hex numbers, is not meant for extensive programming. Editing is difficult and you cannot make copies of the assembler "source code". For real machine language work you need a real Assembler. And DOM 25 has a series of programs revolving around the MASM ASSEMBLER. Now there is a lot that MASM does not do, and anyone who is about to embark on a career as a machine language programmer would do well to spend \$100 or so and purchase a full blown macro assembler with all sorts of bells and whistles. A logical step from MASM is to the commercial S-C Macroassembler. But for those of you just getting started (and who never expect to have more than a gentleman's interest in the process) MASM should work, and the price is certainly right.

A Machine Language Tutorial by Tom O'Brien of the Green Apples in Cedar Falls, Iowa is the last major section on the DOM. The Tutorial will not make you a machine language programmer, but working through O'Brien's examples, and carefully reading through his material will teach you quite a bit about how your Apple, and its 6502 microprocessor work. Other programs on DOM 25 include

ALL PURPOSE DISASSEMBLER

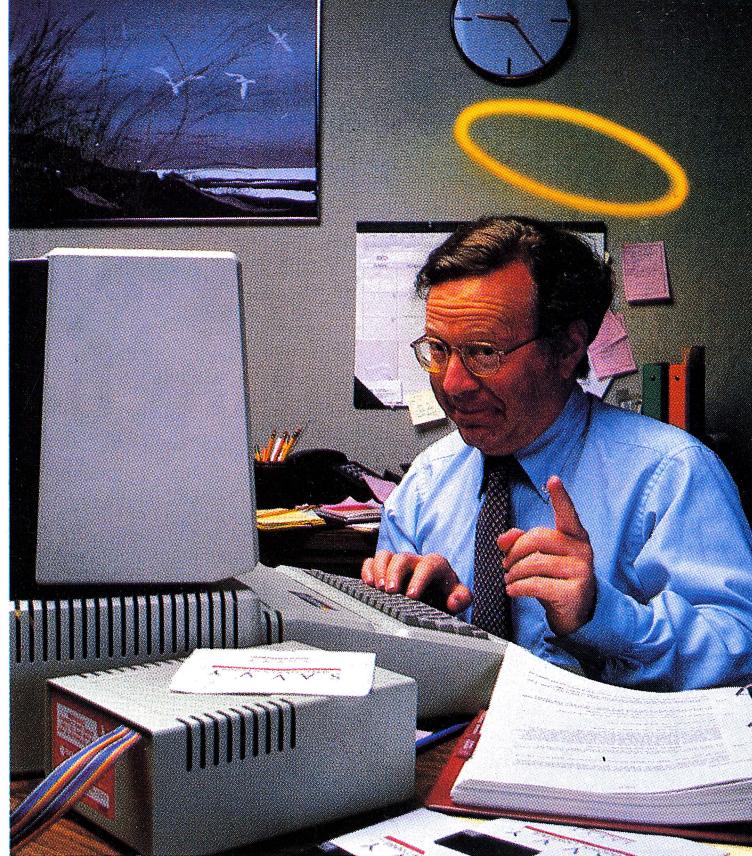
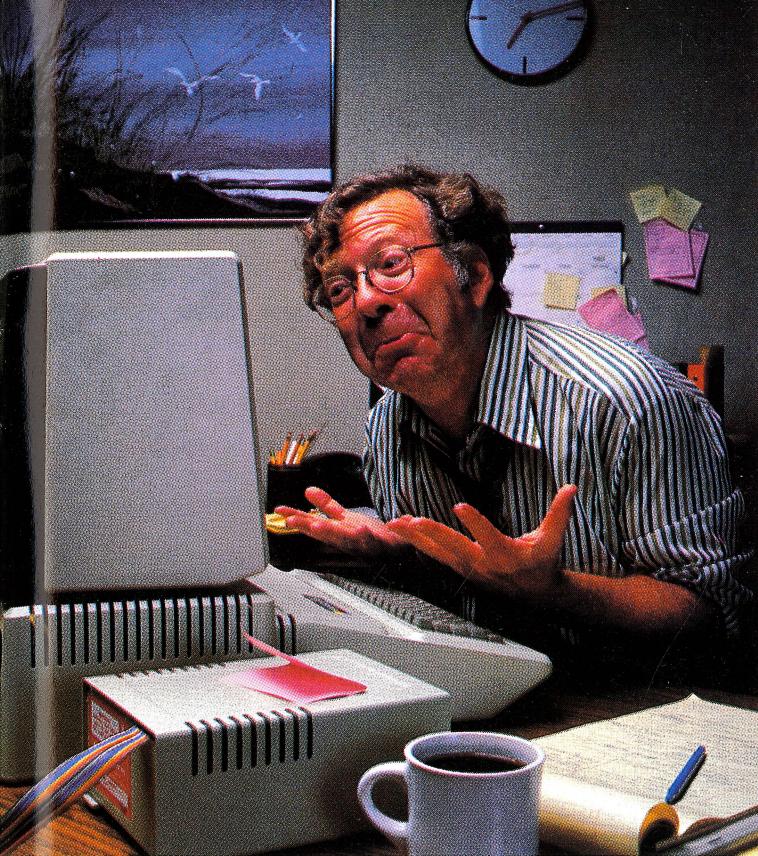
BFILe LIST

MEM/DUMP TO TEXT FILE

MEMORY INTERPRETER

All in all, DOM 25 is quite a bargain. Get it from your IAC member club.





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# Everything But the Kitchen Sink

*Review by Joyce Conklin*

Introduction to BASIC Programming  
by Gary B. Shelly and Thomas J. Cashman  
Anaheim Publishing Co.  
2632 Saturn St, Brea, CA 92621  
\$16.95

There are many factors to be considered when selecting a textbook for use in the public schools. Unlike textbooks for university students, the school system rather than the student pays for the text. More attention is paid to whether the text has a reading level appropriate to the designated user group. If the teacher does not feel comfortable with the book, the correlation of the textbook with the course is likely to be perfunctory at best; perhaps the only reason for issuing the text is so that the students feel that they have a "crutch", but the actual material covered is almost exclusively from the lecture notes. Because computer texts are usually soft-cover, they can't serve as door-stops as I'm sure that some of today's hard-cover texts are utilized! When you find a text that fits your method of teaching, which has attractive printing to encourage the students to read it, and which comes with excellent and detailed support material, the only thing holding you back would be the tight purse strings of the financial officer.

Shelly and Cashman have produced a beginners' text in BASIC programming that answers almost all of the items on my "want-list" for a good text. It is written for use by college level students, but with a small amount of adapting can also be used for high school students. The appearance is very enticing, with four-color separations throughout. Each chapter has its own "color tone", with all illustrations being done in shades of one hue.

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This aspect is credited in the acknowledgements to Marilyn Martin, who has done an outstanding job. Also deserving credit for the layout and drawings is Michael Broussard. The illustrations of program segments have a consistent use of shapes and symbols, which serves to reinforce the learning that has occurred in previous chapters.

The reading level of the text is approximately 8th grade, with some few passages going to 9-1/2 or 10. The sequence of material is not all that different from most beginning texts, but the execution is greatly improved over most others that have crossed my desk during this year. The "obligatory" first chapter includes a definition of data processing terms, but also discusses the "philosophy" of programming design. Given the "wrinkled nose" attitude toward flowcharting which is current among many in the computer field, the authors mention it briefly and just use it from then on as if it were the natural method! Included in the first chapter is a discussion of Program Reviews, a means of peer evaluation of programs at each step from conceptualizing to execution. To quote from the Instructor's Guide:

An important element when writing a computer program is the philosophy with which the programmer approaches the task. The correct philosophy is to write a computer program expecting the program to work properly the first time it is entered and executed on the computer system. «To view» the programming

task as a naturally error-prone activity... is incorrect and should never be presented to the students.... The purpose of a program review... is to «insure» that any errors which have been made will be caught in the early stages of program development.

Subsequent chapters cover INPUT/OUTPUT PROGRAMMING (statement numbers, REMarks, READ and DATA, GOTO); ARITHMETIC OPERATIONS (PRINT using, report editing, TAB, print zones using commas and semicolons); COMPARING (IF... THEN... ELSE, relational operators, strings vs. numeric values, flowchart for decisions, nested IF... THEN... ELSE, tracing program steps, STOP, CONT); LOOPING - INTERACTIVE PROGRAMMING (INPUT, FOR... NEXT, step incrementing - positive and negative, multiple input variables); ARRAYS (creating, loading, multiple arrays, RESTORE, multidimensional arrays, menus, ON... GOTO, GOSUB, ON... GOSUB, sorting); STRING processing (INKEY\$, VAL, LEN, STR\$, LEFT\$, MID\$, RIGHT\$, searching for a substring, STRING\$, ASCII code, CHR\$, ASC); and finally FILES, REPORT GENERATION, AND FUNCTIONS (OPEN, CLOSE, RND, SQR, DEF FN).

While you can see that from the stand-point of Applesoft BASIC, some of the material is available only through patches (PRINT USING, IF... THEN... ELSE) or through translation (GET for INKEY\$, STR\$ statement instead of STRING\$) these are minor items, and may even serve as a springboard for the discussion

of the differences between different BASIC "dialects". There are detailed summaries at the end of each chapter, questions and exercises which do not require program coding, debugging and programming exercises, and supplemental programs. The programs have a business-related tone, rather than a strictly mathematical one. Anyone desiring to use computer programs with a strictly mathematical bent will need to obtain them from another source.

In addition to the text there are three support manuals, which far out-perform anything that I have seen recently in any area, let alone the "hop-on-the-band-wagon" field of computer texts. The Instructor's Guide and Answer Manual includes detailed lesson plans, down to the suggested time required for each activity. While the timing is made to fit 54 lecture hours (a standard college semester) plus programming time outside of the class, with a little thought it could be adapted to the 85-90 class hours of a high school semester. Looking at the suggested time requirements for some of the programs, you are forewarned and can warn your students. The early programs require 1-2 hours from design to entering and execution; later programs require 13-19 hours, or in the case of the files

program, 15-21 hours! Perhaps such a problem could be divided if assigned to high school students. Also included are answers to all the questions, exercises, and program debugging exercises as a part of the chapter outline. In a separate section of the Answer Manual are suggested solutions to all the programming exercises.

Completing the set of materials is a Test Bank with True/False and Multiple Choice questions, and a set of Transparency Masters which reproduce all the drawings (but not the photographs) in the text. There are 100 T/F and 50 Multiple Choice questions for each chapter, but since the same material may be covered in different ways by each kind of question, the authors suggest that the instructor use a carefully designed test, rather than a random question generator. The use of these ancillary materials will greatly reduce the load on the instructor, especially one who is teaching the class for the first time. I am very favorably impressed with this entire set of materials. It would be positively revolutionary and, I am sure, greeted with joy by all if Shelly and Cashman could transfer their knowledge and philosophy to those who are responsible for writing the manuals that come with software products.

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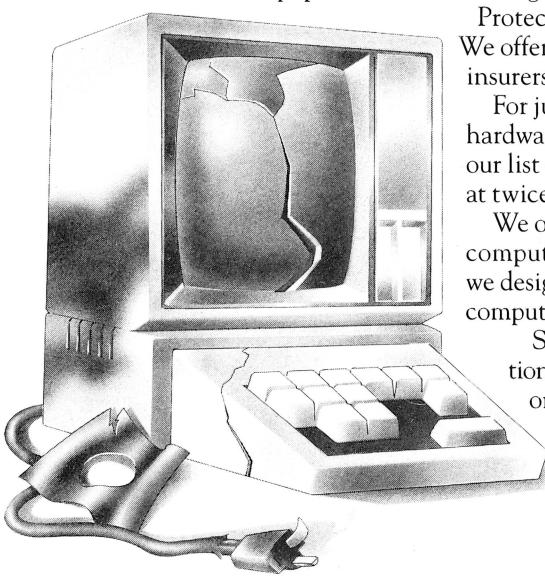
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# The Documenter

## *Review by Woody Liswood*

Published by:  
P80NUT SOFTWARE, Inc.  
P.O. Box 490  
Lilburn, Ga. 30247  
(404) 469 - 0056

Price: \$49.95 plus \$1.05 shipping and handling and 4% more for Georgia customers.

If you have ever taken a formal, or even not-so-formal, programming or computer course, the instructor probably sounded like a broken record saying: "Document, Document, Documentation, etc. . . ."

This program does just that. It creates a flow chart of your Applesoft program. Then, a list of all your program branches are printed at the end.

## How it Works

You load your program, put the Documenter disk in the drive, then BRUN DOC. The program then asks you for the slot number of your printer if you wish to use a printer, or an "0" if you wish to use the screen. It then asks whether you have a serial or parallel interface, and whether you would like "Auto Print". Auto-print gives you a continuous screen display when you select Slot #0. Next you are asked if you would like "Stacked Statements". A "Yes" here places your entire program line within a box, even if you have multiple statements in your program line all separated by a ":". A "No" here unpacks the line and puts each statement in a separate box.

That's it.

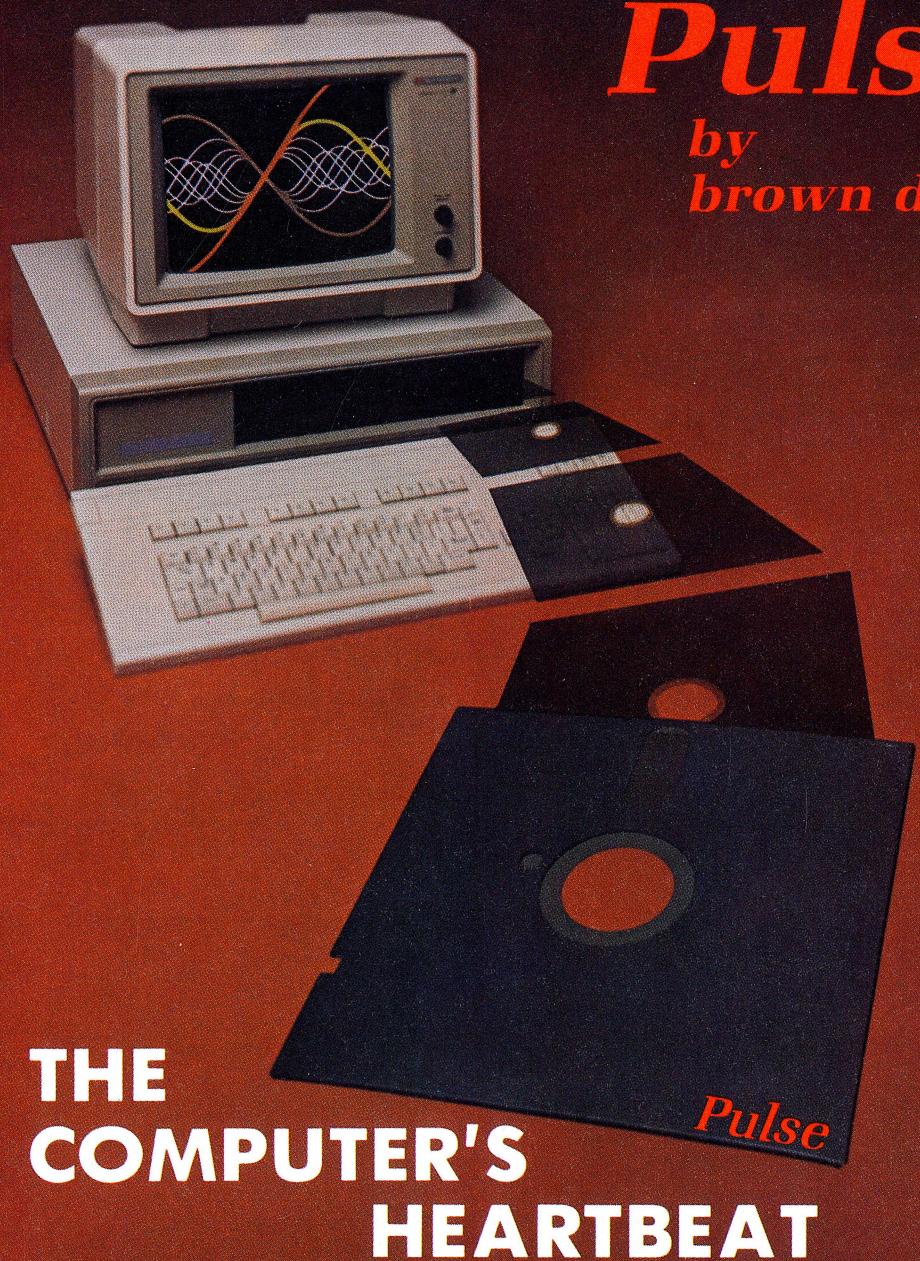
I tested the Documenter on a couple of different programs. Since the printouts are quite lengthy, I will use a sample program that was in an ad for the program. My tests show that this is a very, very slow program. You should start up your program, then go out for dinner. A one page BASIC listing that I use to drive a Grappler board took almost 20 minutes to list. The technique is to load the text screen with the flowchart, then dump the text screen to the printer.

The program comes with a one page documentation sheet. It tells you everything you need to know to run the program.

This is a very special program. If you have a need to document your programming efforts this is a very fancy program. It works. It does what it says it is going to do. Look at the listings. I haven't seen any other program advertised which could do this.

## The Sample Program

```
100 INPUT "DO YOU WANT A COPY OF THE DOCUMENT (Y/N)":A$  
110 IF A$ = "Y" THEN 130  
120 PRINT "I CAN'T BELIEVE YOU SAID NO": GOTO 100  
130 PRINT "COSTS ONLY $49.95"  
140 FOR I = 1 TO 2  
150 FOR J = 1 TO 2  
160 GOSUB 200  
170 NEXT J  
180 NEXT I  
190 END  
200 PRINT "YOU MADE THE RIGHT CHOICE"  
210 RETURN
```



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00120	GOTO	00100
00160	GOSUB	00200

Reply from P80NUT SOFTWARE: "... We designed THE DOCUMENTER with two purposes in mind. First, to document programs and second, to assist in modifying undocumented programs. Upon questioning users we have found the following interesting uses:

1. Students (all levels) are using it to meet class flowcharting assignments.
2. We also sold one to a teacher who had a student turn in flowchart assignments using it. She bought one and plans to integrate it into her classes. She uses it to make flowcharts of her teaching programs.
3. One teacher is experimenting with using it as a factor in grading programs, i.e. shorter, more structured programs are better?
4. Purchasers use it to flowchart purchased programs for changing them to meet their unique needs.



NEW FOR APPLE II AND IIe

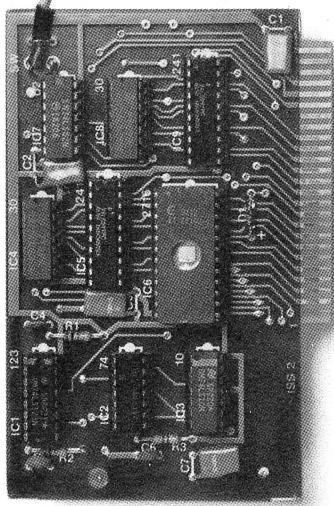
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# Use of the Disk II Interface Card Through Your Own Software

## Part III: Spiral Protection Systems

by John Uhley

This is the third article in our series on accessing a disk drive without use of DOS; its purpose is to explain the theory behind spiral copy protection systems, and to create a working protection system of this type. First, though, let's briefly review some of the basic hardware principles of the Apple Disk II.

Inside the Disk II is a special motor used to move the magnetic head back and forth across the surface of a diskette. Figure A illustrates that rotating this motor in a clockwise direction moves the magnetic head towards higher numbered tracks. Conversely, Figure B illustrates that counterclockwise rotation forces the magnetic head towards the lower numbered tracks.

The rotation of the positioning motor is controlled by four phases. These phases can be thought of as electromagnetic poles. By magnetizing and demagnetizing the four poles in a given order the needle can be made to spin in a clockwise or counterclockwise direction. Figure C illustrates that hitting (magnetizing and demagnetizing) poles 0, 1, 2, 3, and finally 0 again will result in clockwise rotation of the needle. Conversely, Figure D illustrates that counterclockwise rotation of the needle is achieved by hitting poles 0, 3, 2, 1, and 0.

By replacing the needle with a motor and the electromagnetic poles with software controlled phases a functional model of the Disk II's positioning motor can be visualized. This is illustrated in Figure E.

The position of the tracks recognized by Apple DOS does not correspond to the phases of the positioning motor in a 1:1 ratio. Instead, the correspondence of DOS tracks to phases is in the ratio of 1:2. The magnetic head is positioned over an even numbered track if the last phase hit was phase 0, and is positioned over an odd numbered track if the last phase hit was phase 2. This is illustrated in Figure F.

If, however, the last phase hit was phase 1 or phase 3, then the magnetic head is positioned over a 'half-track'. Half-tracks are circular regions of data which lie between, and overlap, two adjacent tracks. Figure G illustrates that writing data on two

adjacent phases will result in the destruction of data on one of the phases. The process is similar to painting over an old picture: The initial picture is lost while the new picture remains. Because of the overlapping of phases it is not possible to write full tracks of data on adjacent phases.

Careful observation of this occurrence will show that there is, however, one way to write on adjacent phases without experiencing this overlapping effect. Figure H illustrates that writing small amounts of data while continually positioning the magnetic head will prevent the destruction of data. Because of the spiral shape of the data (as shown in Figure H) this format is often referred to as a "spiral protection system".

The spiral protection system is effective against nibble copiers because data is written on adjacent phases. Most nibble copiers attempt to read in an *entire* track of data before writing that *entire* track of data back onto another diskette. Since these copiers are writing full tracks of data it is impossible for them to write on adjacent phases, and thus they are unable to replicate the spiral format of the original diskette.

The source code of a "human oriented" spiral protection system is listed at the end of this article. Observation of this routine will reveal that most of the code is dedicated towards making the program look "nice". The actual core routines which write data to the diskette occupy only a fraction of the code. The following paragraphs describe the important functional steps which the program executes in order to create a protected diskette.

The first real task of the program is to format the slave diskette and write a bootstrap loader in standard Apple DOS format. When the slave diskette is booted, the Disk II Interface Card will read this loader into memory and execute it. The loader, in turn, will read and execute the file written in spiral format on the diskette.

After writing the bootstrap to the slave diskette the program checks to make sure that the file to be written does not exceed \$1FFF bytes. If this length has not been exceeded the program converts the file from hexadecimal bytes into valid nibbles.

These nibbles are then written out onto the diskette in spiral format using a sector writing routine similar to the one created in Part II of this series (**Apple Orchard**, August 1983).

Before executing the spiral protection program listed at the end of this article be sure to set up the necessary parameters and files. The following checklist should be executed in order to protect a file using this spiral protection program.

#### CHECKLIST FOR EXECUTION

- 1) Bload the SPIRAL PROTECTION SYSTEM program at \$0800. Also bload the SPIRAL READING program at \$0F00.
- 2) Bload the file to be protected at \$2000.
- 3) Store the starting address of the file to be protected (where it should be loaded for execution) in memory locations \$0300 and \$0301 (LSB first).
- 4) Store the length of the file to be protected in memory locations \$0302 and \$0303 (LSB first).
- 5) Store the value to be used as SYNC in memory location \$0304 (Default value \$FF)
- 6) Store the values of the Open Address Marks in memory locations \$0305 through \$0307 in reverse order (Default values \$AF AA D5).
- 7) Store the values of the Close Address Marks in memory locations \$0308 and \$0309 in reverse order (Default values \$B5 D5).
- 8) Execute the program (CALL 2048 from BASIC or 0800G from the Monitor).

NOTE: A 48K machine is required.

Author's Notes: 1. As our custom made DOS occupies page \$08 (e.g. \$0800-\$0900), you will not be able to protect any program making use of that part of the memory. 2. This DOS is not DOS 3.3, but as we stated, a custom made DOS. You will not have the use of the usual DOS commands when booting a diskette protected by this spiral protection scheme. 3. The maximum length of the programs that can be protected by this system is \$1FFF (e.g. the equivalent of a hi-res page).

This article concludes this series on accessing the Disk II without the use of Apple DOS or RWTS. Hopefully it has cleared up some of the mystery regarding how the Disk II can be accessed through your own software. With the materials discussed in these three articles programs which use unique disk operating systems can easily be developed. I hope that this series has been of help to you and welcome any comments which you might have.

#### REMEMBER

It is the side of the floppy disk opposite to the label, e.g. the underside, which is 'written to' and 'read from' during disk drive operations. Remember this when you lay a disk down on a table surface where it may collect any dust, coffee spills . . .

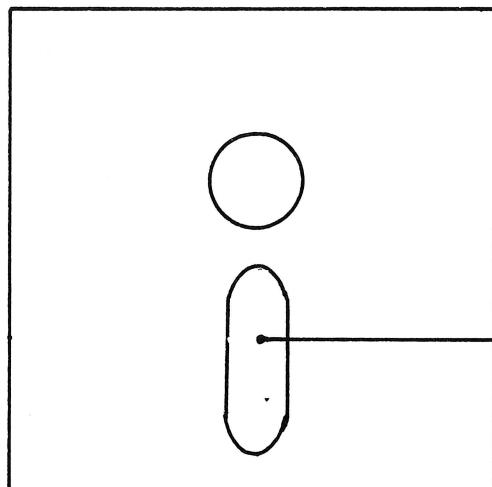


Figure A

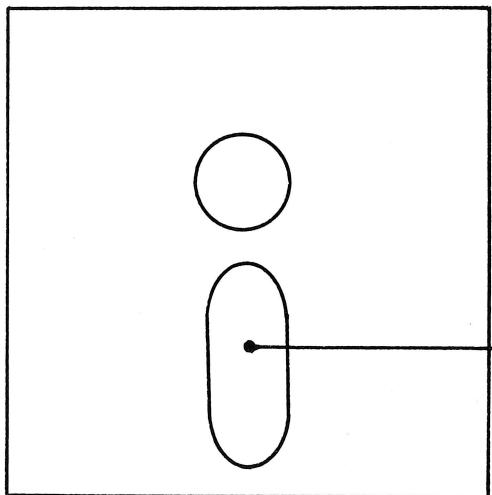
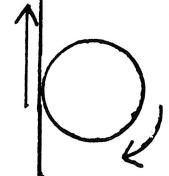
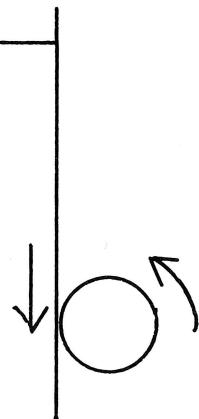


Figure B



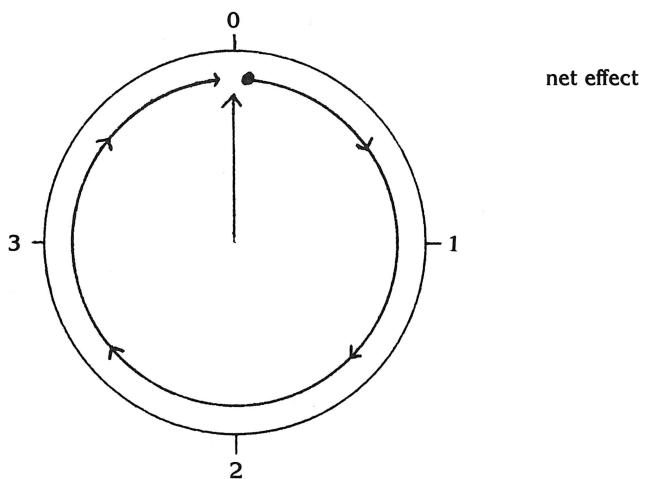
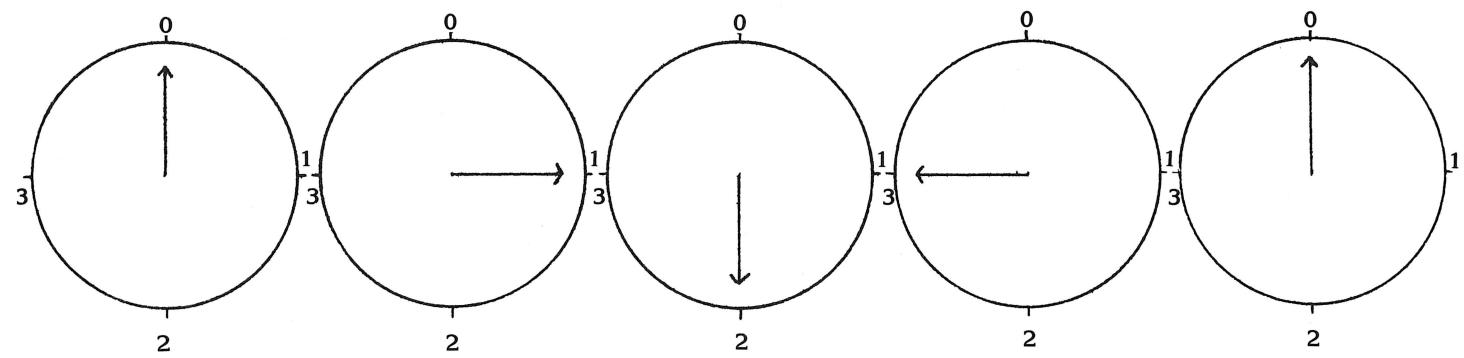


Figure C

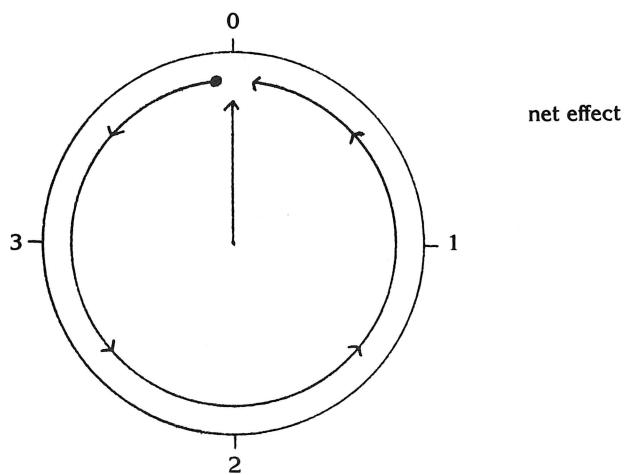
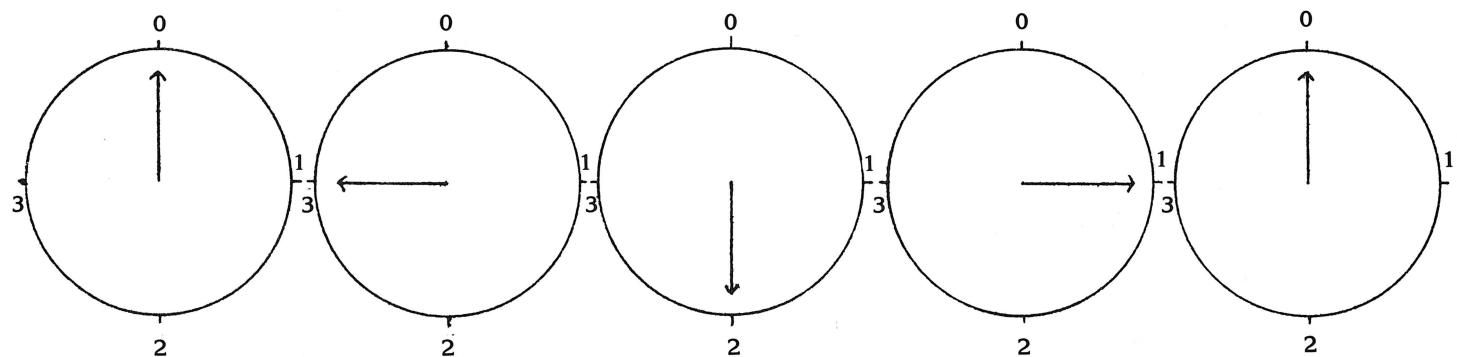


Figure D

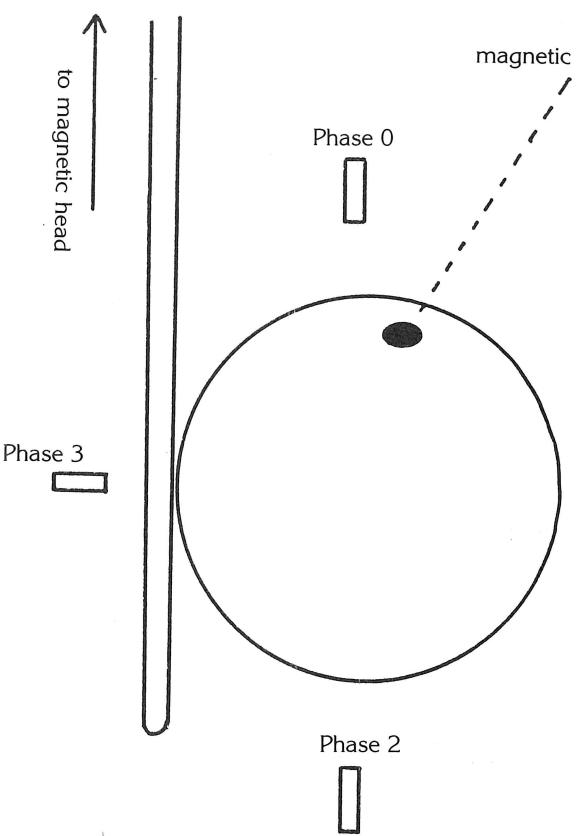


Figure E

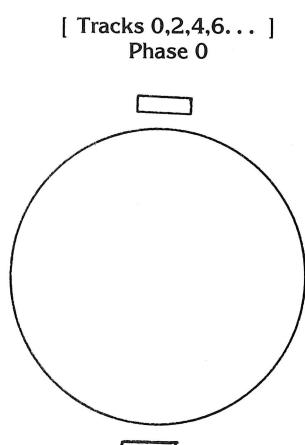
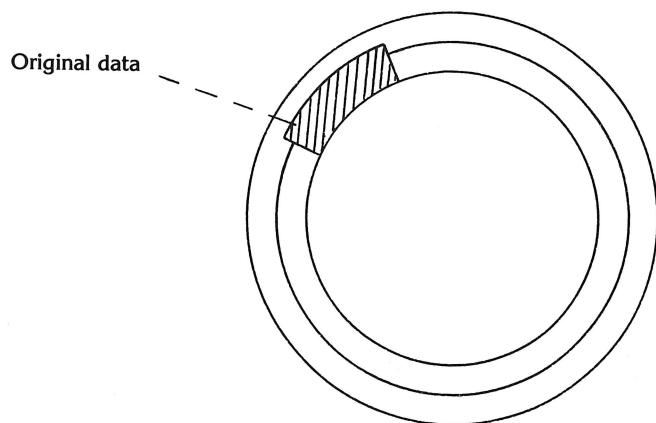


Figure F

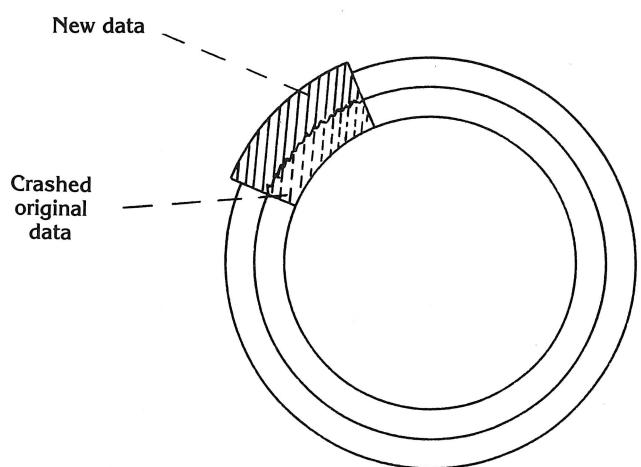
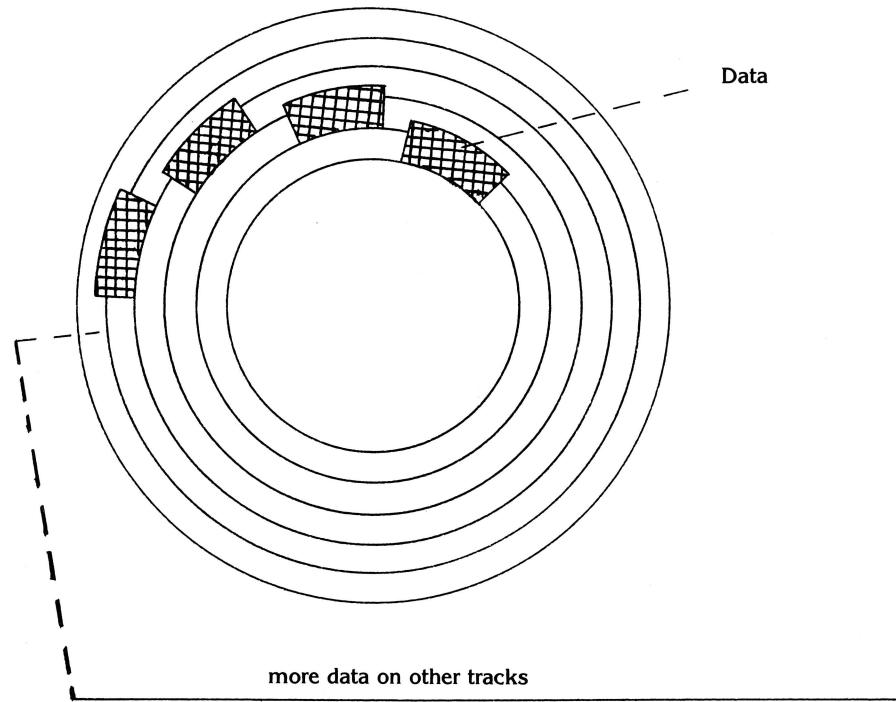


Figure G



## “The Spiral”

**Figure H**

ZERO	EQU	\$000F	*****	*****	*****	STA	HTAB
CURTRK	EQU	\$0010	*****	*****	*****	LDA	#INVTAB
DESTRK	EQU	\$0011	***** GET A BLANK INTO DRIVE *****	*****	*****	JSR	GETBASE
START	EQU	\$0300	*****	*****	*****	LDY	HTAB
LENGTH	EQU	\$0302	*****	*****	*****	LDX	#\$02
SYNC	EQU	\$0304	PROT	LDA #VTABCOM	INVERSEA	LDA	(BASE),Y
DAM	EQU	\$0305		STA VTAB		CMP	#\$A0
CAM	EQU	\$0308		LDA #>IMSG		BEQ	INVERSEC
KBGET	EQU	\$C000		LDY #KIMSG		AND	#\$1F
KBCLR	EQU	\$C010		JSR PRINTASC		STA	(BASE),Y
VTABCOM	EQU	\$000E	PROTLOOP	JSR GETASC	INVERSEB	INY	
WCOUNT	EQU	\$000F		CMP #\$98		CPY	#\$28
NCOUNT	EQU	\$0012		BEQ BEGIN		BNE	INVERSEA
INVTAB	EQU	\$0013		CMP #\$8D		RTS	
GETDOS	EQU	\$03E3		BNE PROTLOOP	INVERSEC	DEX	
GODOS	EQU	\$03D9	*****			BNE	INVERSEB
SPRK	EQU	\$C030	*****			RTS	
ROAM	EQU	\$0FF3	***** BRANCH TO 3 SUB-SECTIONS *****	*****	*****	*****	
RCAM	EQU	\$0FF6	*****		*****	*****	
RCOUNT	EQU	\$0F02	*****		*****	*****	
RSTARTA	EQU	\$0F1F		JSR CLEARLINE	*****	*****	
RSTARTB	EQU	\$0F27		LDA #\$00	INVHTAB	HEX 000C19	
CHECKSUM	EQU	\$0310		JSR INVERSE	*****	*****	
*****				JSR FORMAT	*****	*****	
*****				BCS BEGIN	*****	ROUTINE TO NORMAL COMMAND	
*****				LDA #\$00	*****	*****	
*****				JSR NORMAL	*****	*****	
*****				LDA #\$01	NORMAL	TAY	
*****				JSR INVERSE		LDA INVHTAB,Y	
PHSOFF	EQU	\$C080		JSR WDOS		STA HTAB	
PHSON	EQU	\$C081		BCS BEGIN		LDA #INVTAB	
DISKOFF	EQU	\$C088		LDA #\$01		JSR GETBASE	
DISKON	EQU	\$C089		JSR NORMAL		LDY HTAB	
READSN	EQU	\$C08C		LDA #\$02		LDX #\$02	
WRITESW	EQU	\$C08D		JSR INVERSE	NORMALA	LDA (BASE),Y	
CLEARSW	EQU	\$C08E		JSR WSPRIAL		CMP #\$A0	
SHIFTSW	EQU	\$C08F		BCS BEGIN		BEQ NORMALC	
MONWAIT	EQU	\$FCAB		LDA #\$02		ORA #\$C0	
*****				JSR NORMAL		STA (BASE),Y	
*****					NORMALB	INY	
*****						CPY #\$28	
*****				*****		BNE NORMALA	
*****				*****		RTS	
BEGIN	JSR	HOME	*****	*****	NORMALC	DEX	
	LDA	#>TITLE		LDA #VTABCOM		BNE NORMALB	
	LDY	#<TITLE		STA VTAB		RTS	
	JSR	PRINTASC		LDA #>NEMSG	*****	*****	
*****				LDY #<NEMSG	*****	*****	
*****				JSR PRINTASC	*****	GET READY TO FORMAT DISK	
*****				JSR GETASC	*****	*****	
*****				JMP BEGIN	*****	*****	
MAINLOOP	JSR	GETASC	*****	*****	FORMAT	JSR GETDOS	
	CMP	#\$8D	*****	*****		STA BUFFER+1	
	BEQ	PROT	***** INVERSE CURRENT COMMAND *****	*****		STY BUFFER	
	CMP	#\$9B	*****	*****		LDY #\$01	
	BNE	MAINLOOP	*****	*****		LDA (BUFFER),Y	
	JSR	HOME	INVERSE	TAY		STA SLOT	
	RTS		LDA INVHTAB,Y			INY	

LDA	(BUFFER),Y	STA	RSTARTB	IMSG	ASC " INSERT A BLANK'
STA	DRIVE	JSR	GETDOS		ASC " DISK AND HIT'
LDY	#\$10	STA	BUFFER+1		ASC " "RETURN"
STA	(BUFFER),Y	STY	BUFFER		HEX 00
DEY		LDY	#\$01	*****	*****
LDA	SLOT	LDA	(BUFFER),Y	*****	*****
STA	(BUFFER),Y	STA	SLOT	*****	ASCII DATA FOR "DISK DONE"
LDY	#\$0C	INY		*****	*****
LDA	#\$04	LDA	(BUFFER),Y	*****	*****
STA	(BUFFER),Y	STA	DRIVE	NEMSG	ASC "
INY		LDY	#\$10		ASC "DISKETTE"
AND	#\$00	STA	(BUFFER),Y		ASC "PROTECTED"
STA	(BUFFER),Y	DEY			HEX BD8D
LDY	#\$03	LDA	SLOT		ASC "
STA	(BUFFER),Y	STA	(BUFFER),Y		ASC "HIT RETURN"
*****		LDY	#\$0C		ASC " TO CONTINUE"
*****		LDA	#\$02		HEX 00
*****		STA	(BUFFER),Y	*****	*****
*****		INY		*****	*****
*****		AND	#\$00	*****	ASCII DATA FOR FORMAT ERR
JSR	GETDOS	STA	(BUFFER),Y	*****	*****
JSR	GODOS	LDY	#\$03	*****	*****
BCS	FORMATA	STA	(BUFFER),Y	FERR	ASC " FORMATTING"
RTS		INY			ASC "ERROR-"
*****		STA	(BUFFER),Y		ASC "PROTECTION"
*****		INY			ASC "ABORTED"
*****		STA	(BUFFER),Y		HEX BD8D
*****		LDY	#\$08		ASC "
*****		STA	(BUFFER),Y		ASC "HIT RETURN"
*****		INY			ASC " TO CONTINUE"
FORMATA	LDA	#\$00	LDA	#\$0F	HEX 00
	JSR	NORMAL	STA	(BUFFER),Y	*****
	LDA	#VTABCOM	*****	*****	*****
	STA	VTAB	*****	*****	*****
	LDA	#>FERR	*****	*****	*****
	LDY	#<FERR	***** GO TO DOS AND WRITE IT	*****	ASCII DATA FOR WRITE ERROR
	JSR	PRINTASC	*****	*****	*****
	JSR	RINGBELL	*****	*****	DERR ASC " WRITING"
	JSR	GETASC	JSR	GETDOS	ASC "ERROR -"
	SEC		JSR	GODOS	ASC "PROTECTION"
	RTS		BCS	WDOSA	ASC " ABORTED"
*****			RTS	RTS	HEX BD8D
*****					ASC "
*****					ASC "HIT RETURN"
*****					ASC " TO CONTINUE"
*****					HEX 00
WDOS	LDY	#\$02	*****	*****	*****
WDOSB	LDA	DA,M,Y	WDOSA	LDA	#VTABCOM
	STA	ROAM,Y		STA	VTAB
	LDA	CAM,Y		LDA	#>DERR
	STA	RCAM,Y		LDY	#<DERR
	DEY			JSR	PRINTASC
	BPL	WDOSB		JSR	RINGBELL
	CLC			JSR	GETASC
	LDA	LENGTH+1		SEC	ASC " SPIRAL"
	ADC	#\$01		RTS	ASC "ERROR -"
	STA	RCOUNT	*****		ASC "PROTECTION"
	LDA	START	*****		ASC " ABORTED"
	STA	RSTARTA	***** ASCII DATA FOR GET DISK		HEX BD8D
	LDA	START+1	*****		ASC "
					ASC "HIT RETURN"
					ASC " TO CONTINUE"
					HEX 00

*****	LDA	YTABLE,Y	*****
*****	STA	BASE+1	*****
ASCII DATA FOR TITLE PAGE	RTS		CLEAR CURRENT LINE OF TEXT
*****	*****	*****	*****
TITLE    HEX    BD	TABLE OF THE 24 BASE ADDRS		CLEARLINE LDY    ##27
ASC "    ,			CLEARLINEA LDA    ##A0
ASC "SPIRAL"			STA (BASE),Y
ASC "PROTECTION"	YTABLE    HEX    00048004		DEY
ASC "SYSTEM"		HEX    00058005	BPL    CLEARLINEA
HEX    BD8D		HEX    00068006	RTS
ASC "		HEX    00078007	*****
ASC " JOHN UHLE"		HEX    2804A804	*****
HEX    BD8D		HEX    2805A805	CLEAR THE TEXT SCREEN
ASC "~~~~~"		HEX    2806A806	*****
ASC "~~~~~"		HEX    2807A807	*****
ASC "~~~~~"		HEX    5004D004	HOME    LDA    ##17
ASC "~~~~~"		HEX    5005D005	STA    VTAB
HEX    BD8D		HEX    5006D006	HOMEA    LDA    VTAB
HEX    DB		HEX    5007D007	JSR    GETBASE
ASC "RETURN)	*****		JSR    CLEARLINE
ASC "PROTECT"	*****		DEC    VTAB
ASC "DISKETTE"	PRINTASC	STA    BUFFER+1	LDA    VTAB
HEX    BD8D	STY	BUFFER	CMP    ##FF
HEX    DB	LDA	##00	BNE    HOMEA
ASC "ESCAPE)"		STA    BTAB	LDA    ##00
ASC "EXIT SPIRAL"	PRINTASCA	LDA    VTAB	STA    VTAB
ASC " SYSTEM"		JSR    GETBASE	RTS
HEX    BD8D		JSR    CLEARLINE	*****
ASC "~~~~~"		LDA    ##00	*****
ASC "~~~~~"		STA    HTAB	RINGBELL    LDA    ##10
ASC "~~~~~"	PRINTASCB	LDY    BTAB	RINGBELL    LDY    ##20
ASC "~~~~~"		LDA (BUFFER),Y	RINGBELLB    LDX    ##50
ASC "~~~~~"		BEQ    PRINTASCF	RINGBELLC    DEX
HEX    BD8D8D8D8D8D8D8		CMP    ##8D	BNE    RINGBELLC
ASC "FORMATTING"	PRINTASCB	BEQ    PRINTASCD	BIT    SPRK
ASC "WRITING DOS		CMP    ##5E	DEY
ASC "WRITING SPIRA		BEQ    PRINTASCH	BNE    RINGBELLB
HEX    00		DRA    ##80	SEC
*****	PRINTASCC	LDY    HTAB	SBC    ##01
GETASC    BIT    KBCLR		STA (BASE),Y	BNE    RINGBELL
GETASCA    LDA    KBGET		INC    HTAB	RTS
	CMP    ##7F	LDA    HTAB	*****
	BMI    GETASCA	CMP    ##2A	*****
	RTS	BEQ    PRINTASCD	PREPARE FOR WRITING DATA
		JSR    PRINTASCE	*****
		JMP    PRINTASCB	*****
ENTER THIS ROUTINE WITH	PRINTASCD	INC    VTAB	WSPRIAL    JSR    COMPLEN
THE LINE# IN THE A-REG		JSR    PRINTASCE	BCS    ERROR
		JMP    PRINTASCA	JSR    NIBBALIZE
GETBASE    ASL	PRINTASCE	INC    BTAB	LDA    ##00
		BNE    PRINTASCF	STA    CURTRK
	TAY	INC    BUFFER+1	STA    NCOUNT
LDA    YTABLE,Y	PRINTASCF	RTS	LDA    ##02
STA    BASE	PRINTASCH	LDA    ##20	STA    DESTRK
INY		JMP    PRINTASCC	LDA    ##60



PLA		LDY	#\$FF	PLA	
STA	WRITESW,X	*****	*****	ORA	#\$AA
CMP	READSW,X	†	†	STA	CHECKSUM,Y
NOP		† WRITE OUT 32 BYTES SYNC	†	INY	
INY		†	†	STY	NCOUNT
BNE	WRITRACKC	*****	*****	LDY	#\$00
INC	BUFFER+1	WRITRACKF	LDA	INC	BUFFER+1
*****	*****	SYNC	PHA	LDA	BUFFER+1
†		PLA	PLA	CMP	TEMPB
† WRITE OTHER HALF OF TRACK		BIT	ZERO	BNE	NIBBALIZEA
†		STA	WRITESW,X	LDA	TEMPB
*****	*****	CMP	READSW,X	STA	BUFFER+1
WRITRACKD	LDA (BUFFER),)	NOP		RTS	
PHA		NOP			
PLA		NOP			
STA	WRITESW,)	NOP			
CMP	READSW,X	DEY			
BIT	ZERO	BNE	WRITRACKF	ACTIVATE	LDX
NOP		LDA	CLEARSW,X		LDA
INY		CMP	READSW,X		DISKON,X
BNE	WRITRACKI	INC	BUFFER+1		#\$EF
*****	*****	RTS			STA
†		*****	*****		BUFFER
† WRITE OUT THE CHECKSUM		†	†		#\$08
†		† CLEAR TRACK OUT OF SYNC	†		STA
*****	*****	†	†		BUFFER+1
LDY	NCOUNT	*****	*****	ACTIVATEA	LDY
LDA	CHECKSUM	CLEARTRACK	LDX	ACTIVATEA	#\$12
PHA		LDA	SLOT	ACTIVATER	DEY
PLA		LDA	#\$20		BNE
STA	WRITESW,	STA	WCOUNT		ACTIVATED
CMP	READSW,X	LDY	#\$00		INC
INY		LDA	WRITESW,X		BUFFER
LDA	CHECKSUM	CMP	CLEARSW,X		ACTIVATEDA
INC	ZERO	LDA	#\$00		INC
DEC	ZERO	STA	SHIFTSW,X		BUFFER+1
PHA		CMP	READSW,X		BNE
PLA		NOP			ACTIVATEDA
STA	WRITESW,	BIT	ZERO		RTS
CMP	READSW,X	CLEARA	INC	DEACTIVATE	LDX
NOP		DEC	ZERO		SLOT
BIT	ZERO	CLEARB	BIT		LDA
INY		DEC	ZERO		DISKOFF,X
STY	NCOUNT	NOP			RTS
LDY	#\$02	LDA	#\$00		
*****	†	STA	WRITESW,X		
†		CMP	READSW,X		
† WRITE OUT CLOSE ADDR MARKS	†	INY			
†		BNE	CLEARA		
*****	*****	BIT	ZERO		
WRITRACKE	LDA CAM-1,Y	DEC	WCOUNT		
PHA		LDA	WCOUNT	POSITION	LDA
PLA		BNE	CLEARB		CMP
STA	WRITESW,X	LDA	CLEARSW,X		BEE
CMP	READSW,X	CMP	READSW,X		BCS
PHA		RTS			BCC
PLA		ORA	#\$AA	POSITIONA	RTS
DEY		STA	CHECKSUM,Y	POSITIONB	DEC
BNE	WRITRACKE	INY		POSITIOND	JMP

**Listing 2**

	NOP		08E0- 03 91 07 20 E3 03 20 D9	0A88- 45 00 8D 20 20 20 20 20
READTRKG	LDA	READSW,X	08E8- 03 B0 01 60 A9 00 20 96	0AC0- 20 20 20 53 50 49 52 41
	BPL	READTRKG	08F0- 08 A9 0E 85 02 A9 09 A0	0AC8- 4C 20 50 52 4F 54 45 43
	CMP	CAM+1	08F8- E4 20 01 0C 20 6E 0C 20	0AD0- 54 49 4F 4E 20 53 59 53
	BNE	READTRK	0900- B8 0B 38 60 A0 02 B9 05	0AD8- 54 45 4D 20 8D 80 20 20
READTRKH	LDA	READSW,X	0908- 03 99 F3 0F B9 08 03 99	0AE0- 20 20 20 20 20 20 20 20
	BPL	READTRKH	0910- F6 0F B8 10 F1 18 AD 03	0AE8- 20 20 20 20 4A 4F 48
	CMP	CAM	0918- 03 69 01 B0 02 0F AD 00	0AF0- 4E 20 55 48 4C 45 59 80
	BNE	READTRK	0920- 03 B0 1F 0F AD 01 03 8D	0AF8- 8D 5E 5E 5E 5E 5E 5E 5E
	LDY	\$00	0928- 27 0F 20 E3 03 85 08 84	0B00- 5E 5E 5E 5E 5E 5E 5E 5E
	LDA	TEMP+1	0930- 07 A0 01 B1 07 85 00 C9	0B08- 5E 5E 5E 5E 5E 5E 5E 5E
	AND	TEMP	0938- B1 07 85 01 A0 10 91 07	0B10- 5E 5E 5E 5E 5E 5E 5E 5E
	STA	TEMP	0940- B8 A5 00 91 07 A0 0C A9	0B18- 5E 5E 5E 5E 5E 5E 5E 5E
	TYA		0948- 02 91 07 C8 29 00 91 07	0B20- 5E 8D 80 DB 52 45 54 55
READTRKI	EOR	(BUFFER),Y	0950- A0 03 91 07 C8 91 07 C8	0B28- 52 4E 5D 20 20 20 50 52
	INY		0958- 91 07 A0 08 91 07 C8 A9	0B30- 4F 54 45 43 54 20 44 49
	BNE	READTRKI	0960- 0F 91 07 20 E3 03 20 D9	0B38- 53 4B 45 54 54 45 8D 80
	CMP	TEMP	0968- 03 B0 01 60 A9 0E 85 02	0B40- DB 45 53 43 41 50 45 50
	BNE	READTRK	0970- A9 0A A0 2D 20 01 0C 20	0B48- 20 20 20 45 58 49 54 20
	RTS		0978- 6E 0C 20 B8 0B 38 60 20	0B50- 53 50 49 52 41 4C 20 53
DAM	HEX	96AAD5	0980- 49 4E 53 45 52 54 20 41	0B58- 59 53 54 45 4D 8D 8D 5E
CAM	HEX	AADEFF	0988- 20 42 4C 41 4E 4B 20 44	0B60- 5E 5E 5E 5E 5E 5E 5E 5E
			0990- 49 53 4B 20 41 4E 44 20	0B68- 5E 5E 5E 5E 5E 5E 5E 5E
			0998- 4B 49 54 20 22 52 45 54	0B70- 5E 5E 5E 5E 5E 5E 5E 5E
			09A0- 55 52 4E 22 00 20 20 20	0B78- 5E 5E 5E 5E 5E 5E 5E 5E
			09A8- 20 20 20 20 20 20 20 20	0B80- 5E 5E 5E 5E 5E 5E 5E 8D
			09B0- 44 49 53 4B 45 54 54 45	0B88- 8D 8D 8D 8D 8D 8D 8D 46
			09B8- 20 50 52 4F 54 45 43 54	0B90- 4F 52 4D 41 54 54 49 4E
			09C0- 45 44 8D 8D 20 20 20 20	0B98- 47 20 20 57 52 49 54 49
			09C8- 20 20 20 20 20 48 49 54	0BA0- 4E 47 20 44 4F 53 20 20
			09D0- 20 52 45 54 55 52 4E 20	0BAB- 57 52 49 54 49 4E 47 20
			09D8- 54 4F 20 43 4F 4E 54 49	0B80- 53 50 49 52 41 4C 20 00
			09E0- 4E 55 45 00 20 46 4F 52	0BB8- 2C 10 C0 AD 00 C0 C9 7F
			09E8- 4D 41 54 54 49 4E 47 20	0BC0- 30 F9 60 0A A8 B9 D1 0B
			09F0- 45 52 52 4F 52 2D 20 20	0BC8- B5 05 C8 B9 D1 0B 85 06
			09FB- 20 50 52 4F 54 45 43 54	0BD0- 60 00 04 B0 04 00 05 B0
			0A00- 49 4F 4E 20 41 42 4F 52	0BDB- 05 00 06 B0 06 00 07 B0
			0A08- 54 45 44 8D 8D 20 20 20	0BE0- 07 28 04 A8 04 28 05 A8
			0A10- 20 20 20 20 20 20 48 49	0BEB- 05 28 06 A8 06 28 07 A8
			0A18- 54 20 52 45 54 55 52 4E	0BF0- 07 50 04 D0 04 50 05 D0
			0A20- 20 54 4F 20 43 4F 4E 54	0BF8- 05 50 06 D0 06 50 07 D0
			0A28- 49 4E 55 45 00 20 20 20	0C00- 07 85 08 B4 07 A9 00 85
			0A30- 57 52 49 54 49 4E 47 20	0C08- 04 A5 02 20 C3 0B 20 4B
			0A38- 45 52 52 4F 52 2D 20 20	0C10- 0C A9 00 85 03 A4 04 B1
			0A40- 50 52 4F 54 45 43 54 49	0C18- 07 F0 2A C9 8D F0 18 C9
			0A48- 4F 4E 20 41 42 4F 52 54	0C20- 5E F0 23 09 B0 A4 03 91
			0A50- 45 44 8D 8D 20 20 20 20	0C28- 05 E6 03 A5 03 C9 2A F0
			0A58- 20 20 20 20 20 48 49 54	0C30- 06 20 3F 0C 4C 15 0C E6
			0A60- 20 52 45 54 55 52 4E 20	0C38- 02 20 3F 0C 4C 09 0C E6
			0A68- 54 4F 20 43 4F 4E 54 49	0C40- 04 D0 02 E6 08 60 A9 20
			0A70- 4E 55 45 00 20 20 20 53	0C48- 4C 25 0C A0 27 A9 A0 91
			0A78- 50 49 52 41 4C 20 45 52	0C50- 05 88 10 F9 60 A9 17 85
			0A80- 52 4F 52 2D 20 20 50 52	0C58- 02 A5 02 20 C3 0B 20 4B
			0A88- 4F 54 45 43 54 49 4F 4E	0C60- 0C C6 02 A5 02 C9 FF D0
			0A90- 20 41 42 4F 52 54 45 44	0C68- F0 A9 00 85 02 60 A9 10
			0A98- B8 BD 20 20 20 20 20 20	0C70- A0 20 A2 50 CA D0 FD 2C
			0AA0- 20 20 20 48 49 54 20 52	0C78- 30 C0 8B D0 F5 38 E9 01
			0AA8- 45 54 55 52 4E 20 54 4F	0C80- D0 EE 60 20 EE 0C B0 4B
			0AB0- 20 43 4F 4E 54 49 4E 55	0C88- 20 07 0D A9 00 85 10 85

### Hex Dump for Listing 1

\$B00.E90

0800- 20 55 0C A9 0A A0 BA 20  
 0808- 01 0C 20 B8 0B C9 BD F0  
 0810- 08 C9 9B D0 F5 20 55 0C  
 0818- 60 A9 0E 85 02 A9 09 A0  
 0820- 7F 20 01 0C 20 B8 0B C9  
 0828- 9B F0 D5 C9 BD D0 F5 20  
 0830- 4B 0C A9 00 20 70 08 20  
 0838- B9 08 B0 C4 A9 00 20 96  
 0840- 08 A9 01 20 70 08 20 04  
 0848- 09 B0 B5 A9 01 20 96 08  
 0850- A9 02 20 70 08 20 83 0C  
 0858- B0 A6 A9 02 20 96 08 A9  
 0860- 0E 85 02 A9 09 A0 A5 20  
 0868- 01 0C 20 B8 0B 4C 00 08  
 0870- A8 B9 93 08 85 03 A9 13  
 0878- 20 C3 0B A4 03 A2 02 B1  
 0880- 05 C9 A0 F0 0A 29 1F 91  
 0888- 05 C8 C0 28 D0 F1 60 CA  
 0890- D0 F7 60 00 0C 19 A8 B9  
 0898- 93 08 85 03 A9 13 20 C3  
 08A0- 0B A4 03 A2 02 B1 05 C9  
 08A8- A0 F0 0A 09 C0 91 05 C8  
 08B0- C0 28 D0 F1 60 CA D0 F7  
 08B8- 60 20 E3 03 85 08 B4 07  
 08C0- A0 01 B1 07 85 00 C8 B1  
 08CB- 07 85 01 A0 10 91 07 88  
 08D0- A5 00 91 07 A0 0C A9 04  
 08D8- 91 07 C8 29 00 91 07 A0

# Hex Dumps and Key Perfect

A "Hex Dump" is a machine language program listing which simply shows which value is entered into each memory address for the range of the program. Despite popular opinion on the subject, "Hex" does not refer to the condition afflicting the user, but rather to the fact that the numbers are in Base 16 arithmetic, called hexadecimal.

The Apple Monitor allows you to enter those data bytes as number pairs, in order; the details are in your Reference Manual. Unfortunately, even one incorrect byte will cause undesired results. This can result in many unhappy hours of proofreading and checking.

Key Perfect was written by Ken McCandless to provide a way to verify typed-in program listings from magazines. Nibble Micro Sparc, an IAC Sponsoring Member, is the publisher. This is a first, experimental, use of Key Perfect in **Apple Orchard**, in the interest of helping those who type in listings, particularly hex dumps.

To do this, you need a copy of the Key Perfect Version 4.0 software that will allow you to make use of the checksum tables generated here. The product is available from the International Apple Core for \$29.95.

The tables on this page correspond to the Listings on the immediately preceding pages. Note that the "Total Program Check" item is the File Length parameter in Hex. After the listing is typed in and BSAVED to disk, RUN Key Perfect to check your diskfile. Key Perfect will generate a table which should be identical to the table on this page. If it is not, then one of us did something wrong. The nice thing about Key Perfect is that the table shows you approximately *where* an error is hiding, so if a mistake is made, finding it is much easier.

True, many people shy away from typing in listings. Key Perfect can help, and we're only too glad to co-operate with *Nibble* magazine to help reduce human frustration in the Apple World.

## KEY PERFECT 4.0 RUN ON LISTING 1

CODE	ADDR# - ADDR#
25D9	0800 - 084F
28FB	0850 - 089F
28D9	08A0 - 08EF
2269	08F0 - 093F
2416	0940 - 098F
2DA8	0990 - 09DF
2BBF	09E0 - 0A2F
2705	0A30 - 0A7F
2848	0A80 - 0ACF
1E60	0AD0 - 0B1F
2B8B	0B20 - 0B6F
24E7	0B70 - 0BBF
2885	0BC0 - 0C0F
259E	0C10 - 0C5F
2250	0C60 - 0CAF
2887	0CB0 - 0CFF
270C	0D00 - 0D4F
25E7	0D50 - 0D9F
273D	0DA0 - 0DEF
262D	0DF0 - 0E3F
2A39	0E40 - 0E8F
C0	0E90 - 0E90

**TOTAL PROGRAM CHECK IS : 0691**

## KEY PERFECT 4.0 RUN ON LISTING 2

CODE	ADDR# - ADDR#
2580	0800 - 084F
25C8	0850 - 089F
2890	08A0 - 08EF
039A	08F0 - 08F8

**TOTAL PROGRAM CHECK IS : F9**

0C90- 12 A9 02 85 11 A9 60 85  
 0C98- 00 20 55 0D 20 76 0D 20  
 0CA0- 55 0E E6 11 C6 0B A5 0B  
 0CA8- D0 F2 20 EE 0C A9 02 85  
 0CB0- 11 A9 00 85 07 A5 0E 85  
 0CB8- 08 20 76 0D 20 9E 0D E6  
 0CC0- 11 C6 0B A5 0B D0 F2 A9  
 0CC8- 00 85 11 20 76 0D 20 70  
 0CD0- 0D 18 60 20 70 0D A9 02  
 0CD8- 20 96 08 A9 0E 85 02 A9  
 0CE0- 0A A0 74 20 01 0C 20 6E  
 0CE8- 0C 20 B8 0B 38 60 AD 03  
 0CF0- 03 C9 20 90 01 60 69 20  
 0CF8- 69 01 85 0A 85 0E AD 03  
 0D00- 03 85 0B E6 0B 18 60 A9  
 0D08- 00 85 07 85 09 85 12 A9  
 0D10- 20 85 08 A0 00 B1 07 6A  
 0D18- 09 AA 91 09 C8 D0 F6 E6  
 0D20- 0A B1 07 09 AA 91 09 C8  
 0D28- D0 F7 E6 0A A9 00 51 07  
 0D30- C8 D0 FB A4 12 48 6A 09  
 0D38- AA 99 10 03 C8 68 09 AA  
 0D40- 99 10 03 C8 84 12 A0 00  
 0D48- E6 08 A5 08 C5 0E D0 C5  
 0D50- A5 0E 85 08 60 A6 00 BD  
 0D58- 89 C0 A9 EF 85 07 A9 D8  
 0D60- 85 08 A0 12 88 D0 FD E6  
 0D68- 07 D0 F7 E6 08 D0 F3 60  
 0D70- A6 00 BD 88 C0 60 A5 10  
 0D78- C5 11 F0 04 B0 03 90 06  
 0D80- 60 C6 10 4C 88 0D E6 10  
 0D88- A5 10 29 03 0A 05 00 AA  
 0D90- BD B1 C0 A9 70 20 AB FC  
 0D98- BD B0 C0 4C 76 0D A6 00  
 0DAO- A0 FF BD 8D C0 DD 8E C0  
 0DAB- AD 04 03 9D 8F C0 DD 8C  
 0DB0- C0 EA 24 0F E6 0F C6 0F  
 0DB8- AD 04 03 EA EA EA EA 9D  
 0DC0- 8D C0 DD 8C C0 88 D0 EC  
 0DC8- EA A0 03 B9 04 03 24 0F  
 0DD0- C6 0F 24 0F 9D 8D C0 DD  
 0DD8- 8C C0 24 0F 88 D0 EC B1  
 0DE0- 07 EA EA 48 68 9D 8D C0  
 0DE8- DD 8C C0 EA C8 D0 F0 E6  
 0DF0- 08 B1 07 48 68 9D 8D C0  
 0DF8- DD 8C C0 24 0F EA C8 D0  
 0E00- F0 A4 12 B9 10 03 48 68  
 0E08- 9D 8D C0 DD 8C C0 C8 B9  
 0E10- 10 03 E6 0F C6 0F 48 68  
 0E18- 9D 8D C0 DD 8C C0 EA 24  
 0E20- 0F C8 84 12 A0 02 B9 07  
 0E28- 03 48 68 9D 8D C0 DD 8C  
 0E30- C0 48 68 88 D0 F0 A0 FF  
 0E38- AD 04 03 48 68 24 0F 9D  
 0E40- 8D C0 DD 8C C0 EA EA EA  
 0E48- EA 88 D0 EC BD BE C0 DD  
 0E50- 8C C0 E6 08 60 A6 00 A9  
 0E58- 20 85 0F A0 00 BD BD C0  
 0E60- DD BE C0 A9 00 9D 8F C0

0E68- DD 8C C0 EA 24 0F E6 0F  
 0E70- C6 0F 24 0F C6 0F EA A9  
 0E78- 00 9D 8D C0 DD 8C C0 C8  
 0E80- D0 EC 24 0F C6 0F A5 0F  
 0E88- D0 E8 BD BE C0 DD 8C C0  
 0E90- 60

Hex dump for  
Listing 2

\*F00..FF8

0F00- 01 A9 00 85 03 A5 2B 85  
 0F08- 00 20 4B 08 A9 00 85 01  
 0F10- A9 04 85 02 20 6C 08 A9  
 0F18- 00 85 02 20 6C 08 A9 00  
 0F20- 85 04 A9 02 85 02 A9 20  
 0F28- 85 05 20 6C 08 20 94 08  
 0F30- E6 02 E6 05 C6 03 A5 03  
 0F38- D0 F0 20 66 08 AD 1F 08  
 0F40- 85 10 AD 27 08 85 11 6C  
 0F48- 10 00 60 A6 00 BD 89 C0  
 0F50- A9 EF 85 04 A9 D8 85 05  
 0F58- A0 12 88 D0 FD E6 04 D0  
 0F60- F7 E6 05 D0 F3 60 A6 00  
 0F68- BD 88 C0 60 A5 01 C5 02  
 0F70- F0 04 B0 03 90 06 60 C6  
 0F78- 01 4C 7E 08 E6 01 A5 01  
 0F80- 29 03 0A 05 00 AA BD 81  
 0F88- C0 A9 55 20 AB FC BD 80  
 0F90- C0 4C 6C 08 A6 00 A0 03  
 0F98- BD 8C C0 10 FB D9 F2 08  
 0FA0- D0 F4 88 D0 F3 BD 8C C0  
 0FA8- 10 FB 2A 91 04 C8 D0 F5  
 0FB0- BD 8C C0 10 FB 31 04 91  
 0FB8- 04 C8 D0 F4 BD 8C C0 10  
 0FC0- FB 2A 85 06 BD 8C C0 10  
 0FC8- FB 85 07 EA BD 8C C0 10  
 0FD0- FB C0 F7 08 D0 BE BD 8C  
 0FD8- C0 10 FB C0 F6 08 D0 B4  
 0FE0- A0 00 A5 07 25 06 85 06  
 0FE8- 98 51 04 C8 D0 FB C5 06  
 0FF0- D0 A2 60 96 AA D5 AA DE  
 0FF8- FF

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Page	Advertiser	Help #	Page	Advertiser	Help #
29	3M	001	7	Microsoft	038
12	Alpha Logic Business Systems	002	35	Micro Design	039
19	Applied Engineering	003	20	Micro Dimension	040
114	B.R. Green	004	33	Micro Pro International	041
57	Black Sun	005	28	Micro Ware	042
107	Blue Chip Software	006	116	Mijo	043
71	Brown Disk Manufacturing	007	115	Multitech	044
112	Cases Inc.	008	95	Nibble	045
12	Central Point Software	009	98	Nibble Notch	046
45	Computer Station	010	101	Northeast Expositions	047
25	Control Data Corporation	011	65	Omega Microware	048
20, 21	Dark Star Systems	012	26, 27	Orange Micro	049
46	David Data	013	47	Orbital Systems	050
17	Digital Acoustics	014	63	Peelings II	051
14	Doss Industries	015	48	Personal Tutor Assoc.	052
13	Douglas Electronics	016	28	Pirates Harbor	053
89	E.T.C.	017	8, 9, 105	Protecto Enterprises	054
73	East Side Software	018	106	Quinsept	055
67	Excalibur	019	116	RCM Software	056
1	Executive Peripherals, Inc.	020	97	Rising Sun	057
43	Fiberbilt	021	28	Seneca	058
94	Finer Programming Service	022	Cover 4	Sierra On-Line	059
109	Flexible Software	023	102	Softkey Publishing	060
104	Flowersoft	024	59	Software Support	061
Cover 3	Hayes Microcomputer	025	118	Solutions, Inc.	062
6, 16, 48, 69	International Apple Core	026	47	Southern Calif. Research	063
92, 110			113	Sublogic	064
108	Innovative Data Technology	027	110	T & W Systems	065
87	Ivers	028	117	Tencal	066
103	JDR Microdevices	029	46	Thunderware	067
91	Kensington Microware	030	53	TIMECOR	068
14	Last Electronics	031	119	Townsend Micro	069
Cover 2	Leading Edge	032	99	Utilico	070
69	Lewis Video Productions	033	111	Virtual Combinatics	071
5	LJK	034	49	Videx	072
14	M & R Enterprises	035	55	Xerox Education Publications	073
43	MDS Software	036	61	Zoom Electronics	074

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- Apple II/II Plus
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- Lisa
- IBM PC or workalike
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- Other

3. I have owned a microcomputer since

- Before 1977  1977
- 1978  1979
- 1980  1981
- 1982  1983
- not yet

4. I use my computer primarily for

- Home
- My Business
- Hobby
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- Other

5. I use my computer primarily with

- Word Processor
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- Graphics
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- Games
- Control of other Devices

6. I spent on software in the past 12 months:

- less than \$100
- \$100 - \$300
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006	046	086	126	166	206	246
007	047	087	127	167	207	247
008	048	088	128	168	208	248
009	049	089	129	169	209	249
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027	067	107	147	187	227	367
028	068	108	148	188	228	368
029	069	109	149	189	229	369
030	070	110	150	190	230	360

031	071	111	151	191	231	361
032	072	112	152	192	232	362
033	073	113	153	193	233	363
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006	046	086	126	166	206	246
007	047	087	127	167	207	247
008	048	088	128	168	208	248
009	049	089	129	169	209	249
010	050	090	130	170	210	250

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012	052	092	132	172	212	252
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027	067	107	147	187	227	367
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- 10 MHz

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- 256K Bytes RAM

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- Pseudo-disk operations
- Track buffering (p-System)

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- ETC MC68000 System Monitor
- ETC p-System (version IV) to Apple DOS Interface Utility

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- Apple DOS 3.3
- UCSD p-System (version IV) Interpreter—executes UCSD Pascal, FORTRAN-77 and BASIC P-Code

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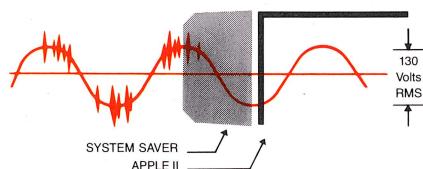
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The most important peripheral for your Apple II and IIe.



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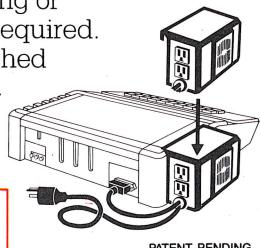
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## Easy Installation

Just clips on.  
No mounting or  
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Color matched  
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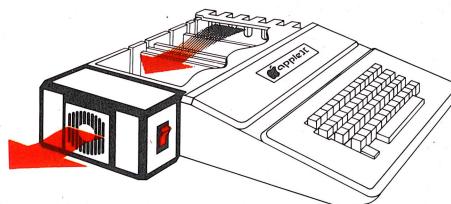


PATENT PENDING

## For Cooling

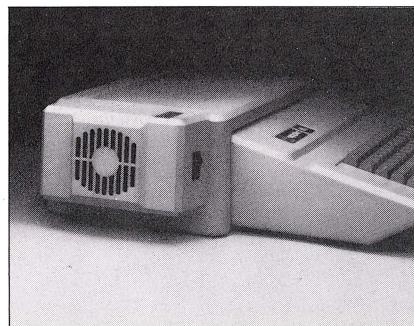
As soon as you add 80 columns or more memory to your Apple II you need SYSTEM SAVER.

Today's advanced peripheral cards generate more heat. In addition, the cards block any natural air flow through the Apple II creating high temperature conditions that substantially reduce the life of the cards and the computer itself.



SYSTEM SAVER provides correct cooling. An efficient, quiet fan draws fresh air across the mother board, over the power supply and out the side ventilation slots.

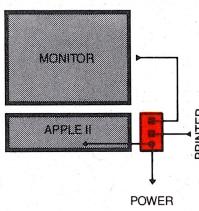
## Compatible with Apple Stand



## For Operating Efficiency

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Interbank No.

Charge Card No.

Credit Card Signature

Card Expires



# The New Stuff

## New Products For The Apple

*Edited by*  
**Mark L. Crosby**



Producers of products for Apple Computers should send news releases two months in advance:

### NEW PRODUCTS EDITOR

Apple Orchard  
908 George St.  
Santa Clara, CA 95050

The IAC cannot be held responsible for claims made by manufacturers.

*The most comprehensive listing and description of new temptations, delicacies, and necessities for your Apple. Notice too that we've made it even easier for you to find out more about these items: just circle the corresponding number on the Apple Orchard Direct Help Card a bit farther ahead in this issue. We'll forward the requests directly to the manufacturer.*

## HARDWARE

### Input/Output

**The PRO 100 detachable keyboard** is a 100 key keyboard that features 3 modes with no chip changes, and 5 foot cables. Offers 18 software supported function keys; 25 Apple BASIC keys and 22 VisiCalc keys to put user commands into one key function. Offers horizontal and vertical cursor movement, separate number pad with enter key, relocated reset key (soft set) and a full 128 ASCII coded keyboard. Has automatic repeat, typewriter style configuration, 35 cps typing input and high reliability keyswitches - \$265.00. Optional upper/lower case chip (Rev. 7 and later) and a Pre-boot diskette contains utilities, keyboard information and a useful word processor and graphics program that demonstrates the programming flexibility of the function keys - \$35.00.

*Circle Help No.67*

Amkey, Inc.  
2200 Ballardvale Street  
Wilmington, MA 01887  
(617) 658-7800

**Infax 101A disk drive** features a removable 10 megabyte data cartridge. Your Apple can have almost infinite storage capacity

with this new drive. Features microprocessor-based error correction; user transparent error detection and correction; automatic start-up diagnostics, idle drive shutdown, error recovery procedures; host adapter/controller and software supports up to 4 drives simultaneously; cartridge write protect switch; non-contact head to disk interface. Comes with disk drive, data cartridge, power supply, cables and personal computer adapter. Software included supports Apple DOS 3.3, Pascal and CP/M, provides for quick copying, backup and file management - \$1,795.00.

*Circle Help No.68*

Vufax, Inc.  
5301 Covington Highway  
Decatur, GA 30035  
(800) 241-1119; (404) 981-6778 (GA)

A new **Laboratory Thermometer System** for the Apple II Plus takes up to seven precision temperature sensors. With a real-time clock calendar, it can control data recording on disk or printer. Sensors can be extended up to 1,000 feet for remote sensing and 8 output lines are provided for controlling external devices. The temperature range is from -50 to +150 Celsius (-58 to 302 F). Readings may be converted and presented in degrees Farenheit, Centigrade or Kelvin as desired. No computer expertise is necessary. Air or piping types of probes are available. - \$260.00 with 2 air probes, interface card, software on disk, and an instruction manual. Includes a 90 day limited warranty. Requires an Apple II with 48K and disk.

*Circle Help No.75*

Assembly Associates  
P. O. Box 551

### Contents:

#### HARDWARE

Input Output  
Memory  
Printers/Plotters  
Miscellaneous

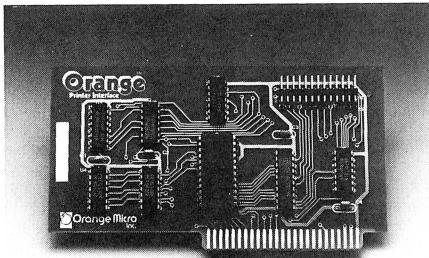
#### SOFTWARE

Business (General)  
Communications  
Educational  
Financial  
Games/Simulations  
Graphics  
Languages (Programming)  
Music  
Utilities  
Word Processing

#### BOOKS/CATALOGS

#### MISCELLANEOUS

Epping, NH 03042  
(603) 679-8410



**Dual Function Interface Card** allows a printer and modem, or any other combination of parallel/serial peripherals to be connected to and controlled by the Apple II. It is compatible with BASIC, Pascal, and CP/M operating systems and features software selectable configuration options \$229.00. At your local dealer.

*Circle Help No.69*

Videx Inc.

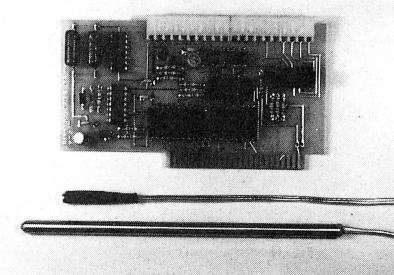
897 N.W. Grant Avenue  
Corvallis, OR 97330  
(503) 758-0521

The **Orange Interface for Apples** and printers has more than 15 firmware commands for text screen dumping and formatting on any Apple II computer. It is compatible with most parallel printers. Includes an 80 column screen dump for the Apple //e. Other commands include a 40 column screen

dump, page length and margin sets, add or delete line feeds, and much more. When not in use for formatting, the Orange Interface acts as a standard parallel interface, compatible with virtually all Apple software, CP/M and Pascal. \$87.00 includes complete documentation, a 5 foot parallel printer cable and a full 90 day warranty.

*Circle Help No.76*

Orange Micro  
1400 N. Lakeview  
Anaheim, CA 92807  
(714) 779-2772



**Diskulator 64K-512K** will work with the Apple //e. Includes DOS 3.3, Pascal, CP/M, Macrodisk-Multi which allows you to set up to 3 RAM-disks in presettable sizes from 16K to 512K, Macrospeed high speed disk copy program particularly useful for multiple copies - load the whole disk to the card and copy from there. Upload/download back-up/retrieval programs can be used for disk copying under program control and for memory diagnostics. MagiCalc, the new spreadsheet, will automatically utilize Macrotech memory boards, including the Diskulator. Features variable column widths, flexible move commands, the largest spreadsheet capability and many other advanced features.

*Circle Help No.70*

Microtech Computer Products Ltd.  
3249 Hackett Avenue  
Long Beach, CA 90808  
-or-  
1370 Marine Drive  
North Vancouver, B.C.  
Canada V7P 1T4  
(604) 984-9305

The APIC parallel printer interface card includes card, cable, and Graph-it graphics software. Works with any standard parallel printer. Graph-it, a complete graphics dump program allows you to do a screen dump to any of the following printers: Apple Dot Matrix, MPI, IDS, NEC, Okidata, Silentype, Epson, Trendcom, Anadex, C. Itoh, and Centronics. Simply choose your printer from a menu and print. You can print graphs, charts, equations, grids, logos, titles, and Hi-Res Apple graphics. You can also magnify, print normal or reverse image, do page centering and cropping, or insert graphics, superscripts, and subscripts into any Applewriter II file - \$129.00

*Circle Help No.72*

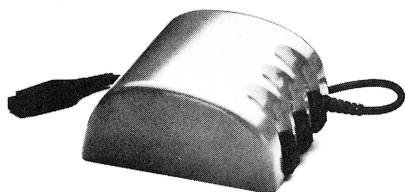
SSM Microcomputer Products, Inc.  
2190 Paragon Drive

San Jose, CA 95131  
(408) 946-7400

**Command Control Mouse** is optically-encoded and enables users of personal and small business computers to edit, draw lines or select menu choices without ever touching the keyboard. Model 50-2110 for the Apple II is used by simply sliding the hand-held device across a desktop surface. The user can quickly move the cursor to any point on the CRT screen - add, delete or move words and shapes with the touch of a button. It functions as a word processing editor, spreadsheet analyst, and an alternate input device. Three multiple function buttons can be used for any number of program applications. Comes with a five-foot long tail-like cord that connects to the computer via an interface card. With the interface card, Command Control Mouse will perform multiple functions written into software programs with mouse control options.

*Circle Help No.77*

WICO Corporation  
6400 Gross Point Road  
Niles, IL 60648



The **Touch Tone Decoding Modem** connects the direct dial telephone network with a host computer and may be used in conjunction with any host computer capable of asynchronous communications via an RS-232 port. Autoanswer circuitry is incorporated into this unit. It goes off-hook and awaits suitable Touch Tone input for two minutes. If no input is received, the modem resets automatically to on-hook and awaits the next call. Converts touch tones to the ASCII equivalent and sends it in a serial stream to the host. Outgoing data is transmitted normally by the modem at 300 or 1200 bps. An audio port for voice response is also available. Communications with the host RS-232 is at 300, 600, or 1200 baud, via a standard D-25 connector. In voice response applications, the digital input of the modem can be replaced with an audio input circuit - \$500.00

*Circle Help No.71*

Microperipheral Corporation  
2565 152nd Avenue N.E.  
Redmond, WA 98052  
(206) 881-7544

**Arcade-Dapter** with Auto-Repeat permits you to use the new arcade-quality Atari compatible joysticks with your Apple II computer. No software drivers required. Works with all Apple II games which use standard or user-definable keyboard for



SCORE HIGHER ON THE SAT USING  
THIS 5 1/4 INCH DISKETTE ON THE  
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7310 PARKDALE AVENUE  
CINCINNATI, OHIO 45237  
(513) 761-0380  
MASTER CARD OR VISA

mats. Features lightning fast response; incredible action; auto-repeat function, using either the joystick or keyboard. Requires a Rev. 4 or newer Apple II or II Plus computer. \$41.95.

*Circle Help No.73*

Computechniques  
P.O. Box 245  
Fairfield, OH 45014  
(513) 829-5052

**The Operator** is a single card modem with all of its sophisticated features tucked into one circuit board. No costly add-ons or external boxes to complicate things. Just plug it directly into the slot of your Apple II (any type) or Apple compatible computer and you're ready to communicate. Comes complete with easy documentation plus start-up software programs on disks. Compatible with ASCII Express Pro, Data Capture, Modem Magic II, TermExec, Transcend I, II, and III, VisiTerm, Z-Term, and many more. Features 110/300 baud full or half duplex; auto answer with disconnect, rotary or Touch-Tone, key-set compatible. \$159.95.

*Circle Help No.74*

TIMECOR  
P.O. Box 8928  
Boston, MA 02114  
(617) 720-4090  
(617) 720-3600 (Modem); (800) 824-7888  
operator 52

The **B & D RS-232 Serial card** does it all. Communicate with a modem, remote terminal or Teletype. Flip a switch and have letter quality serial printer protocol. \$44.95 as a kit or \$59.95 assembled. Included is an RS-232 type connector and a comprehensive instruction manual. Also includes an extended 6 month warranty and a terminal emulation program.

*Circle Help No.79*

B & D Electronics  
P. O. Box 3651  
Lawrence, KS 66044  
(913) 841-4182

**The Networker** is a plug-in single-slot direct connect modem for your Apple II (any type) or other Apple compatible computer. It even comes complete with its own communications software that features "data capture" to lock the messages into your Apple's RAM, and then save the information onto a disk for easy reference and review. A terminal program displays on-screen help menus, continuous updates of memory usage, carrier presence, baud rate, communications status, all while taking in and displaying information from any computer. Supports both originate and answer modes in half or full duplex. \$129.00. For \$179.00 you also get Netmaster for advanced users which permits high speed transfer from Apple to Apple without error, uses its own disk operating system, and is completely configurable to under-

stand any computer, even mainframes. File size is unlimited. Netmaster may be purchased separately for \$79.00.

*Circle Help No.80*

Zoom Telephonics, Inc.  
207 South Street  
Boston, MA 02111  
(800) 631-3116; (617) 423-1288 (MA)

The **Floppycard III** introduces 8-inch floppy disk storage to the Apple /// computer. In addition to standard single- or double-sided 8-inch drives, Floppycard III also supports all disk drives that emulate the popular 8-inch disk interface, including the Amlyn 5.25-inch 5.5 Megabyte cartridge drive and the C. Itoh 5.25" 1.1 Megabyte floppy drive. Operates in any SOS-compatible environment, including Apple Business BASIC, Pascal, and SoftCard III CP/M. It has its own microprocessor to allow the Apple III to process interrupts (keyboard input, communications, printer output, etc.) while the diskette is being read or written. Features up to 4.4 Megabytes of storage on standard 8' floppy drives.

*Circle Help No.81*

Burtronix  
1667 N. O'Donnell Way  
Orange, CA 92667  
(714) 974-6171

The **Burtronix Printercard** /// allows Centronics type parallel printers to be used with the Apple ///, and features software drivers to print both text and graphics. The graphics

## AMPERSOFT

There you are, sitting in front of a dead screen, wondering if your Apple has broken down or if your program has gone to sleep.

If you're running into slow executions and long and frequent pauses, AMPERSOFT will give you a lot more time to be creative. It's an entire library of Applesoft enhancements that run at machine language speeds.

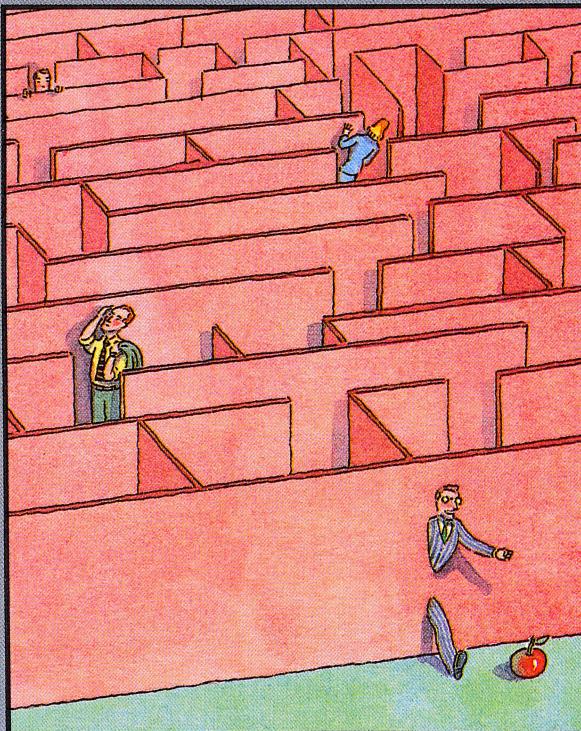
If most programs take away memory, this one gives it back. AMPERSOFT is the only Applesoft enhancement package that puts DOS and itself in the upper 16K of a 64K system, giving you a new usable gain of thirty percent instead of a net memory loss.

And AMPERSOFT is a pleasure to use. All the utilities are accessed from within your Applesoft programs by inserting simple, one-line statements preceded by an ampersand.

They let you Sort sixty times faster than Applesoft. Collect garbage two to three hundred times faster. And format reports to the screen or printer any way you want them.

If you're tired of waiting for your Apple, you don't have to wait any more. AMPERSOFT is here.

### Utility Routines Library for the Apple II/III



#### SPECIFICATIONS:

##### SPEED ADVANTAGES:

Garbage collection — 300x faster.  
Sorting — 60x faster.  
Disk array Sort/Recall — 16x faster

##### OTHER FEATURES:

30% more user program memory.  
Matrix arithmetic.  
Selective array clear.  
Full PRINT USING formatting for numbers and character strings.  
Two-key disk commands.  
Compatible with GALE, PLE, FID, MUFFIN, COPYA and all DOS Toolkit programs.  
Allows concurrent residence of Applesoft and integer BASIC with 32K RAM card, extra 16K card, or ROM card in another slot.

##### AUTHOR:

Cornelis Bongers

##### SYSTEM REQUIREMENTS:

At least 64K. Applesoft, DOS 3.3 and one Disk Drive. Operates with all Applesoft-Compatible computers including the Apple IIe and the Franklin ACE. Apple II Plus requires RAM card — 16K or larger.

##### PRICE:

\$49.95 postpaid

##### ORDERING INFORMATION:

If your Apple dealer doesn't have AMPERSOFT you may order directly by mail or phone. (Mass. residents please add 5% sales tax.) We also accept VISA and MasterCard.

Stop Waiting for your Apple.

**MicroSPARC Inc.**

10 Lewis Street, Lincoln, MA 01773 (617) 259-9710

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Apple is a registered trademark of Apple Computer Inc.

routines print any of the Apple /// graphics modes using dot matrix printers, including color printouts when using the IDS PRISM printer. Simple commands permit the graphics printouts to be rotated left or right, expanded horizontally, expanded vertically, cropped, inversed (black/white exchanged), left margined, and top margined. The graphics printouts may come from buffer 1, buffer 2, both buffers side by side, or in the new 560 x 384 resolution mode with both buffers interleaved. Features include auto line feed, auto form feed, top of form, and printer initialization. Compatible with Apple Business BASIC, Pascal, and Soft-Card /// CP/M - \$159.00.

*Circle Help No.82*

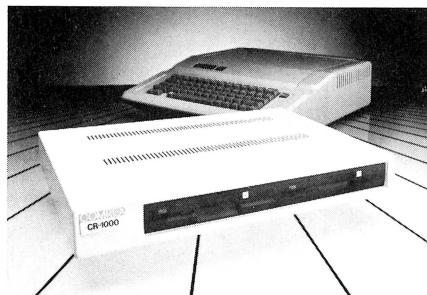
Burtronix

1667 N. O'Donnell Way  
Orange, CA 92667  
(714) 974-6171

**ComDrive**, a new double floppy disk drive replaces two standard Apple floppy drives of 143 Kbytes capacity, yet occupies half the space. The CR-1000 is plug-compatible with Apple computers and provides a total of 286 Kbytes formatted capacity in a single, low-profile package. The ComDrive fits snugly on top of an Apple computer. A monitor can be mounted, in turn, on top of the disk drive. Features a seek time of 40 milliseconds and a track density of 48 tracks per inch in a single-sided, single-density format. Dimensions of the slim, compact drive are 14.9 inches wide, 10.1 inches deep, and only 2.1 inches high. It weighs about 10 pounds. \$599 suggested retail price.

*Circle Help No.83*

Comex International, Inc.  
3701 Skypark Drive  
Torrance, CA 90505  
(213) 373-0280



Touch the **Magellan Light Pen** to your Apple II or //e and your graphic and game designs come to life. High-speed, high-resolution graphics with the control of one dot accuracy. Connects to a micro-miniature electronic module you plug into your computer game port. Its input/output transparent design lets you use the same port for game paddles, joysticks and other accessories simultaneously. Think of it as a normal pen and paper - except the paper is replaced by your monitor. Simply point the pen on the screen and press the programmable switch on the pen's body. In seconds,

you can draw points, lines, circles, squares and other standard shapes. Once a drawing is complete, it can be saved and/or printed to be used or edited later. Driver software is included along with Graphics Drawing software and complete documentation. Provides vertical blanking signal for flicker-free graphics - \$189.95.

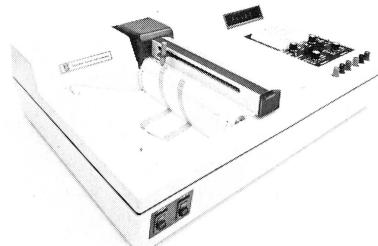
*Circle Help No.78*

Magellan Computer, Inc.  
4371 East 82nd Street, Suite D  
Indianapolis, IN 46250  
(317) 842-9138

The Model 3120T professional **Analog-To-Digital Recorder** with graphics contains an internal solid state memory for storage of 16,000 data points. Features two-channels with a maximum sensitivity of 0.1 mv/cm with an accuracy of 0.1%. The time scale is accurate to 0.01%. Digitizing speed is 20 KHz with 12-bit precision. A bidirectional RS-232C interface is offered as an option and a software package converts the recorder to a graphics plotter with a vector generator, a high level instruction set, and a 53 character ASCII set. Software for interfacing to Apple II is also available - \$2,995.

*Circle Help No.84*

Bascom-Turner Instruments  
111 Chapel Street  
Newton, MA 02158  
(617) 964-3434



**Project 1** presents a low cost Centronics type interface card. This unbuffered parallel interface card is designed to work with Epson, Star Micronics, Axiom, Codex or almost any 8-bit parallel printer available. In addition, for only \$9.95, they supply you with a graphics capability for your Epson printer. Some of the graphics features available are: normal and inverse image, large or small image, load program direct from the disk, dump existing programs already in the computer. Works under Apple DOS 3.3. Complete with an FT interconnect cable with Centronics type plug, factory wired for the Epson MX printer family - \$59.95 plus \$9.95 for the graphics option.

*Circle Help No.85*

Project 1  
220 Crescent Way, Bldg O  
Anaheim, CA 92801  
(714) 774-0394

**P/S Buffer Card** lets your Apple II and //e print parallel or serial. Memory is expandable to 64K maximum in increments of 16K with plug-in RAM modules available from your dealer. It has both a parallel

output port and an RS-232C standard serial output port. When you need to change from parallel to serial, serial to parallel, or output both simultaneously, you don't have to physically change cards. The intelligent firmware lets you do it by either software command or (optional) hardware switch. Interfaces with most popular parallel printer cards including Apple, Epson, Grappler, Graphitti, PRT-1 and Tymac. 16K card for use with existing parallel interface card \$125.00. Stand-alone card with parallel interface \$199.00. With Graphitti Graphics and cables \$249.00. 16K memory expansion modules \$25.00 each. Hardware switch option \$25.00.

*Circle Help No.86*

Prometheus Products Inc.  
45277 Fremont Blvd.  
Fremont, CA 94538  
(415) 490-2370

**Joysticks** from Hayes products use only precision high quality components. Compare for yourself and save up to 40%. These highly accurate and reliable joysticks provide a 360 degree cursor control for total coordinated x/y control. Fine trim adjustment on both axes and a self-centering feature which can be disengaged to allow for a free-floating stick are standard features on all Hayes joysticks. The Mach II is \$39.95, The Mach III (with handle push button switch for rapid fire) is \$49.95 plus \$2.00 postage and handling.

*Circle Help No.87*

Hayes Products  
1558 Osage Street  
San Marcos, CA 92069  
(619) 744-8546

## Memory

The **S'Card** from Legend Industries, Ltd. is the first RAM card to upgrade an Apple II or Apple /// from 64K to a full 1 **Megabyte**. Can be installed into any slot and up to 7 cards can be installed into one Apple II for 7 Megabytes. All of the software written for the 64KC and 128KDE cards will work with the S'Card including all of the software from other software houses. New software being developed by Legend will take advantage of the added RAM capacity of the S'Card.

*Circle Help No.88*

Legend Industries, Ltd.  
2220 Scott Lake Road  
Pontiac, MI 48054  
(313) 674-0953

## Printers/Plotters

The **Gorilla/Banana** is an 80 column, tractor-feed dot-matrix printer, capable of printing alphanumerics or graphics on fan-fold forms from 4 1/2 to 10 inches wide. Print speed is 50 characters per second. The

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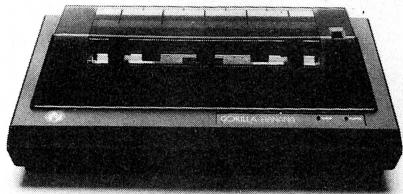


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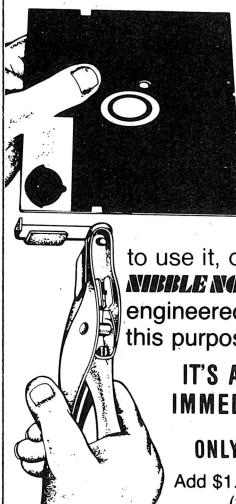
print head is a uni-hammer design for greater simplicity and consistency. Characters are printed in a clear 5x7 matrix similar to that used by many CRT terminals. Normal character spacing is the standard 10 characters per inch (cpi) or double wide 5 cpi can be substituted under software control. Graphics mode has a density of 63 x 60 dots per inch. Includes a Centronics type parallel interface. \$249.95.

*Circle Help No. 114*  
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*Circle Help No. 113*  
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*Circle Help No. 112*  
Anadex, Inc.  
9825 De Soto Avenue  
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**The Converter** will turn Olivetti and IBM electronic typewriters into computer printers and/or terminals. Printing speeds range from 175 to 230 words per minute. Converters are available for either Centronics type parallel or RS-232C serial input. The serial version can send as well as receive data and is available for IBM models 50, 60 and or 75. Both versions are available for Olivetti ET121 or ET221. The Converter fits inside the typewriter, does not affect normal use and requires no modifications. Serial interfaces have selectable baud rates, hardware or XON, XOFF handshake protocols and a built in self test mode.

*Circle Help No. 111*  
Vertical Data Systems, Inc.  
1215 Meyerside Drive, Unit 2  
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(416) 671-1752

**PrintMate 150** wide-carriage printer prints at 150 characters per second using advanced logic-seeking impact printing. Features 10, 12, 15 or 17 characters per inch. It provides high-density, high-speed correspondence printing, plus double-wide for emphasis. Establish, change or display the operating mode from the front of the printer using a 12-digit keypad. An expandable print buffer takes you from 2K to 68K to provide high-speed interleaved printing with computing. Three paper paths - front, back or bottom. Custom character sets may be downloaded to a PrintMate 150 with a 4K or larger buffer. Their exclusive AP-Pak is available for most popular computers and lets you print in dozens of stylized fonts, in characters up to 5/8-inch high - \$995.00.

*Circle Help No. 110*  
Micro Peripherals, Inc.  
4426 South Century Drive  
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(800) 821-8848

## Miscellaneous Hardware

**The Arcade Board** uses the same hardware as many of the coin-operated arcade machines. Plug arcade action and sound into your Apple II for spectacular color graphics with rapid, smooth animation and simultaneous sound effects, using only BASIC. Features 32 sprites available for super easy animation; 16 colors available simultaneously in all 3 graphics modes; 256 x 192 Hi-Res resolution and 64 x 48 Lo-Res resolution; 40 x 24 text mode uses user-defined character sets; 16K on-board RAM; store up to 14 pages of Hi-Res graphics or text; 60 Hz interrupt timer for audio-video timing/synchronization; 3 tone generators with a 9 octave range; 16-level volume controls; noise generator for gunshots, bombs, etc.; automatic envelope control; true NTSC video signal; software video-select switch \$295.00. Two Arcade Boards

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Los Angeles, CA 90024  
(213) 1473-2102

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*Circle Help No.90*  
Ohm/electronics  
746 Vermont Street  
Palatine, IL 60067  
(312) 359-5500

**Saybrook** is the 68000 21/16 bit co-processor for the Apple II. Saybrook transforms the Apple into an awesome micro-mainframe computer, capable of 10-20 times the speed of the Apple, with twice the memory on-board. Features MC68000 32/16 bit processor (identical to apple's Lisa) runs programs ten to twenty times faster than the Apple II. Gives you 128K RAM on-board expandable to 512K on-board. It will run all Apple BASIC, FORTRAN, and Pascal programs ten to twenty times faster. In addition, Saybrook accesses the enormous UCSD p-System library of software, as well as CP/M-68K. Includes the Saybrook 68000 co-processor with 128K RAM on-board; the UCSD p-System (Version IV) with Pascal, FORTRAN-77, and BASIC compilers. In addition, Applesoft-compatible, 68000 BASIC is included. \$1,550.00. CP/M 68K optional. UNIX available soon.

*Circle Help No.91*

Analytical Engines, Inc.  
3415 Greystone, Suite 305  
Austin, TX 78731  
(512) 346-8430

**The Mate** is a strategy game peripheral for the Apple II and compatible computers. It allows the chess player the ultimate in computer usage. Morphy improved chess program has 9 levels of play with four built-in time keepers. Also features hints to improve your game. It can monitor two players and take back unwanted moves. Includes a true sensor chessboard with magnetic chess pieces - no more entering your move on the keyboard. The computer will sense the move and respond with its own, through LED lights on each square of the board. The screen also shows the game in progress. Plug it into any available slot - \$199.95. Quantity price reduction available.

*Circle Help No.92*

Applied Concepts, Inc.  
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(214) 680-8361

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Com-Protect Inc.  
Rt. 4-Box 427X  
Slidell, LA 70458  
(504) 641-1316

**Dat.a.clock** multifunction plug-in card is fully compatible with Apple computers including the Apple II, II Plus and //e. Purchaser has the option of ordering the Dat.a.clock either assembled by the manufacturer or in a do-it-yourself kit. Has date, month, and year capability, and the on-board battery has a two to three-year life. There is also an externally accessible EPROM. Price: \$85.00 (assembled) or \$55.00 (kit with easy assembly instructions).

*Circle Help No.94*  
P & B Research Consultants  
231 East Grand Blvd.  
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The **PRO-100** is an intelligent detachable, capacitance keyboard with enclosure for use with the Apple II or II Plus. It offers 100

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*Circle Help No.97*

Acorn Systems, Inc.

4455 Torrance Blvd., #108

Torrance, CA 90503

(213) 371-6307

**EPROM Programmer** is microprocessor based. Programs 2716, 2732, 2732A and 2532 EPROMS. Zero insertion force sockets are standard. Features 25 or 22 volt programming voltage option; copy from EPROM to EPROM automatically; RS-232 interface with selectable baud rates. Includes a power supply and thorough user documentation including example software drivers for popular computer systems, including Apple, IBM-PC and CP/M Command set can be used from host computer or terminal - \$195.00.

*Circle Help No.98*

Boulder Logical Testing, Inc.

P.O. Box 902

Boulder, CO 80306

**AppleChips Chip Kits** provide step-by step instructions and replacement integrated circuit (IC) chips so anyone can fix most Apple II and II Plus system failures. Two kit types are currently available. The Motherboard Kit, Type MK-2-1, provides at least one of every IC you will need (except the 6502 microprocessor and Apple ROMs). It contains 41 ICs of 32 types, an IC puller, and a Troubleshooting Guide. The Disk Drive/Controller Kit, Type KD-2-1, provides ICs for servicing one Apple disk controller card and two Apple Disk II drives. It contains 15 ICs of 10 types and the Troubleshooting Guide. Extensive manual helps in diagnosing both motherboard and disk drive failures, and allows users with no electronics training or experience to fix most single IC failures (the most common kind). You CAN do it YOURSELF! Suggested retail price for the MK-2-1 is \$49.95 and for the DK-2-1 \$34.95. Available through many IAC member clubs at special prices. Not for the Apple //e. Apple-Dayton, Inc. is the Apple users group in southwestern Ohio. The AppleChips Chip Kits and Troubleshooting Guide have been developed and extensively tested and improved during the past year through actual use by Apple-Dayton Members.

*Circle Help No. 66*

Apple-Dayton, Inc.

P.O. Box 1666

Fairborn, OH 45324

**EPROM Programmer** Model EP-2A-79 has been in the field for three years. Software is available for most all of the microcomputers including the popular CP/M, FLEX, HDOS operating systems. Driver packages available for F-8, 6800, 6809, 8080, 8085, Z-80, 1802, 6502 and 2650 based systems. Compatible with Apple and others - \$169.00. Personality modules are from \$17.00 to \$39.00.

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*Circle Help No.100*

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516 5th Avenue

New York, NY 10036

(212) 706-5907

**DX-1 Sound Effects System** features digital reproduction of real sound. Image at the touch of a key reproducing the sound of hands clapping, sounding identical to a real hand clap; or a whistle, a finger snapping or even the sounds of an eight piece drum set (even cymbals). Twenty-two pre-recorded (digitally) sounds are included, with countless ways to vary each one. Play drum sounds in real time on the Apple keyboard. Program your own sequences or select pre-programmed sound sequences. Load/Save programmed sequences on disk. Works with Apple //e also - \$139.95.

*Circle Help No.101*

'Decillionix

P.O. Box 70985

Sunnyvale, CA 94086

(408) 735-0410

The **MicronEye Bullet** is a solid state digital camera specially designed for your Apple II Plus. Includes all hardware, software and optics necessary for plug-and-go operation. The camera has 128 x 256 element resolution capable of transmitting up to 15 frames per second. Electronic shutter can be manually or software controlled. Several sample programs are included which allow the user to explore the capabilities of the MicronEye. Software allows you to continuously scan, freeze frame, frame store, frame compare, print to Epson printer or produce pictures

with shades of grey. Source code is provided for all software on an unprotected diskette - \$295.00.

*Circle Help No.102*

Micron Technology Incorporated

2805 East Columbia Road

Boise, ID 83706

(208) 383-4000

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*Circle Help No.103*

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Chagrin Falls, OH 44022

(216) 247-3110

**Microvox text-to-speech synthesizer** can annunciate data transmitted at high baud rates over telephone lines or serve as an unlimited vocabulary audio interface for telephone transaction applications. Features include 64 digitally programmable levels of inflection, a 6K text-to-phoneme algorithm, 750 character buffer, RS-232C serial connector, music and sound effects capability, and adjustable baud rate. Attached to a terminal keyboard, Microvox can function as a typewriter for the blind or as a communicator for the vocally impaired. Every ASCII character is recognized (including punctuation) as it is typed and can be echoed automatically - \$295.00.

*Circle Help No.104*

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Woodmere, NY 11598

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*Circle Help No. 106*

ALF Products, Inc.  
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An **ALIS automation system** together with your Apple II can eliminate manual recording and setting of instruments. ALIS systems can work with pH meters, strain gauges, timers, positioners, microbalances, flow meters, BCD devices - in short almost any device which accepts or generates an analog or digital signal. Each ALIS system is complete with preassembled hardware, from Apple interface to cabling, terminal box and test switches - as easy to install as a printer. Interface software lets your Applesoft programs talk directly with the real world at up to 10,000 data points per second. Display results with a modifiable hires graphing system. Documentation of over 150 pages includes sample programs and application notes to assist in automating your lab. Models include Analog Output - 2 channels (\$841), Analog Input - 16 channels (\$1,149), Precision Analog Input - 16 channels (\$1,517), Digital Input/Output - 32 bi-directional channels, quad timers, interrupts (\$1,600). Requires a 48K Apple with Applesoft and DOS 3.2 or 3.3.

*Circle Help No. 107*

Eco-Tech, Inc.  
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(517) 337-9226

The new **Polaroid computer camera** connects directly to your personal computer with a software package that allows you to get 3.25 x 4.25 inch color prints or conventional 35mm or new Polaroid Autoprocess 35mm slides from monochrome monitors. The system lets you choose from a palette of 72 colors, and transforms black and white graphics into high resolution color prints and transparencies. Graphics created on color monitors can be directly transmitted, or colors can be reassigned. Pricing, exclusive of software, starts at under \$1,000. VideoPrinter model 4 con-

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*Circle Help No. 108*

Polaroid

575 Technology Square  
Cambridge, MA 02139  
(800) 225-1618; (617) 547-5177

The **DTACK Grande** is an Apple compatible 68000 microprocessor board. With an effective speed of 10 MHz with no wait states, this board has one megabyte of memory. It is capable of multi-tasking using interrupts, which will give you the luxury of running more than one program at once or setting up type-ahead buffers or print spoolers. HALGOL is a high speed BASIC-like language that runs at close to 68000 Assembly language speeds. It is currently under development including Apple BIOS which turns the Apple into an Input/Output handler exclusively, and lets the 68000 take over and run things. For more information contact the manufacturer.

*Circle Help No. 109*

Digital Acoustics  
1415 E. McFadden, Suite F  
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*Circle Help No. 122*

The Specialty Software Company  
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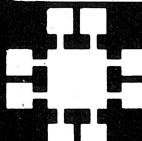
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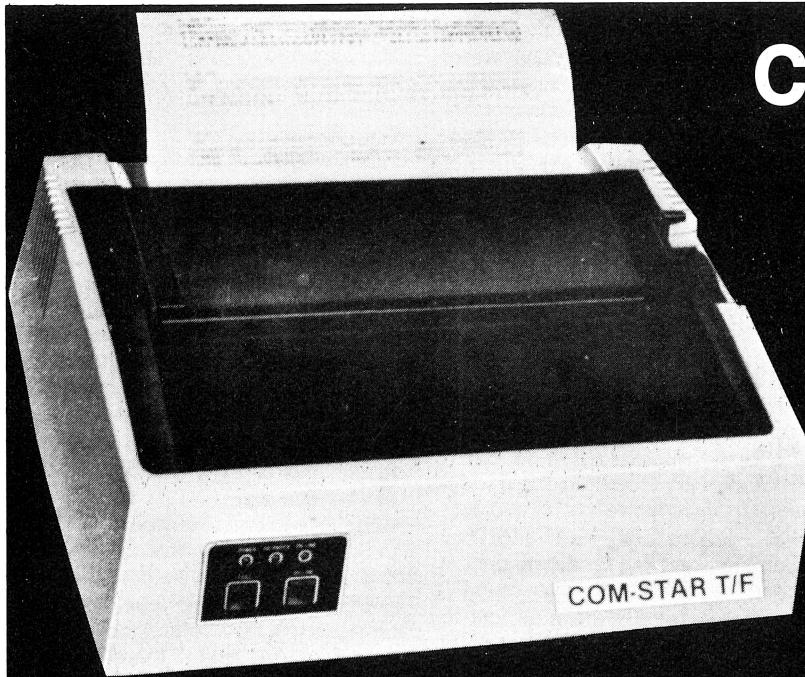
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*Circle Help No. 123*  
Southwestern Data Systems  
10761 Woodside Avenue, Suite E  
Santee, CA 92071  
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recognition as well as counting. Word Power is a drill and practice program designed to help anyone increase his or her vocabulary. The disk includes several practice files and allows users to input other specific files.

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*Circle Help No. 130*  
Educomp Enterprises  
191 North 650 East  
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River Bend Software  
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*Circle Help No. 139*

Simple Soft, Inc.  
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*Circle Help No. 138*

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*Circle Help No. 132*

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Alan Vaughan  
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You're the lucky apprentice who gets to sort all the tantalizing gumballs at the famous Sticky Sole Gumball Factory. The job is not without its problems, however. Overzealous

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*Circle Help No. 153*

Broderbund Software - at your local dealer.

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*Circle Help No. 152*

Davka Corporation  
845 N. Michigan Avenue Suite 843  
Chicago, IL 60611  
(800) 621-8227; (312) 944-4070 (IL)

**Parthian Kings** game concerns feudal civil war - many nobles are declaring themselves king of Parthia. The whole situation is wide open for a brilliant commander, a great strategist and a leader of men, namely you. A 1 to 4 player game, in which you create, buy and command your own army, and use a great wizard to do your bidding and casting of terrible spells upon your enemies. On diskette for all Apple II computers with 48K of memory.

*Circle Help No. 151*

Avalon Hill Game Company

**S.C.I.M.M.A.R.'S** (Surface Contra-Gravity Individual Manned Mobile Anti-Vehicle Raiders) is a game of gladiatorial armor combat in the far future. Heroes drive personal combat vehicles more akin to modern jets than tanks, with immense speed and acceleration. It is combat of maneuver, reflex and quick thought, where only the best survive. On diskette for any Apple II computer with 48K of memory \$30.00.

*Circle Help No. 150*

Avalon Hill Game Company

**T.A.C.** (Tactical Armor Command) is a game of armored combat during World War II. You control individual tanks, anti-tank guns, and infantry squads. For one or two players, featuring Hi-Res graphics, enhanced sound and stimulating challenge. Five different scenarios are available for Meeting Engagement, Rear Guard, and Static Defense, to Breakout and Stalemate. The players control up to eight vehicles, guns and squads simultaneously, utilizing the equipment for either the German, British, Russian or American forces. A simula-

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*Circle Help No. 149*  
Avalon Hill Game Company  
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Baltimore, MD 21214

**Road Warriors** has 3-D high resolution graphics for 1 or 2 players. What would you call a world of renegade drivers? (California.—PCW.) A place filled with the most dangerous and reckless pilots ever to punch metal over asphalt. The highway outlaws of society, banished to a planet with 50,000 miles of empty roadway and each other. The outsiders call it prison - the Road Warriors call it heaven. Features pause game and sound on/off; individual high scores and names kept; graduated levels of difficulty. Requires an Apple II or II Plus with 48K and DOS 3.3 \$29.95.

*Circle Help No. 148*  
Morningstar  
39 Florence Street  
San Francisco, CA 94133  
(415) 441-2535

You are caught deep in the caverns with vicious white rats biting off your tail and the enchanted frog blocking the passage in front of you. Your objective . . . recover the stolen jewel of your king. You're in control, what do you do next? Boa will help you if you know how to control him. Continuous sound effects and music throughout the game. Experience the **Adventure of Boa** . . . a high resolution arcade style game created by Micro Magic for strong hearted, game-men. Requires an Apple II with 48K and disk \$29.95. plus \$2.00 shipping.

*Circle Help No. 147*  
Micro Magic  
Condor Computing, Inc.  
908 Memorial Parkway, N.W., Suite C  
Huntsville, AL 35801

**In Evolution**, only the strong survive. You start as an amoeba trying to advance up the evolutionary chain to become a human. To attain this goal you will have to go through 6 distinctively evolutionary steps: an amoeba fighting microbes while trying to eat DNA; a tadpole eluding fish to catch waterflies; a rodent chased by snakes while looking for cheese; a beaver attacked by alligators while building a dam; a gorilla protecting his food from monkeys; a man battling genetic mutants in an elastic background. Features up to 99 levels; keyboard or joystick control; machine language speed; colorful Hi-Res graphics; keeps the top 10 scores; arcade sound and full convenience controls. For the Apple II or II Plus.

*Circle Help No. 146*  
Sydney Dataproducts, Inc.  
129-444 Camino Del Rio South  
San Diego, CA 92108  
(619) 298-5886 (USA); (604) 734-8822  
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**Crypto Cube** is a family word puzzle. Work your way through the many word puzzles

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*Circle Help No. 145*  
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(800) 572-7767; (415) 546-1866 (CA)

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placement correctly and you build a balanced pile. Stack them wrong and your pile comes crashing down. Each block you add racks up more points. Complete a pile and Barnaby takes you to the next level of difficulty. But hurry, you're piling blocks in a race against the clock.

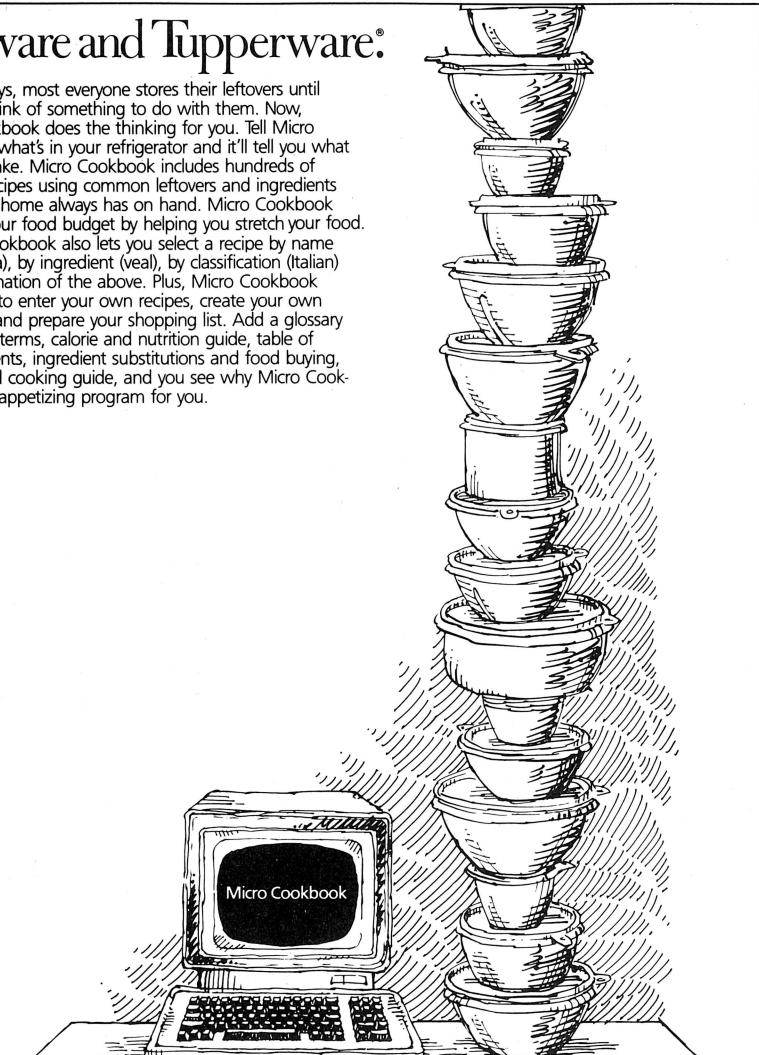
*Circle Help No. 144*  
Microlab, Inc.  
2699 Skokie Valley Road  
Highland Park, IL 60035  
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 Golden Knight Software  
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black and white prints, or overhead transparencies are also available. The information can be transmitted over ordinary telephone lines or mailed to Visual Horizons in the form of a floppy disk which can hold material for up to 35 slides. All materials are delivered by mail. The manufacturer will offer a complete range of newly developed software to enable Apple owners to access a variety of different type sizes, styles, and background designs. *Circle Help No. 159*

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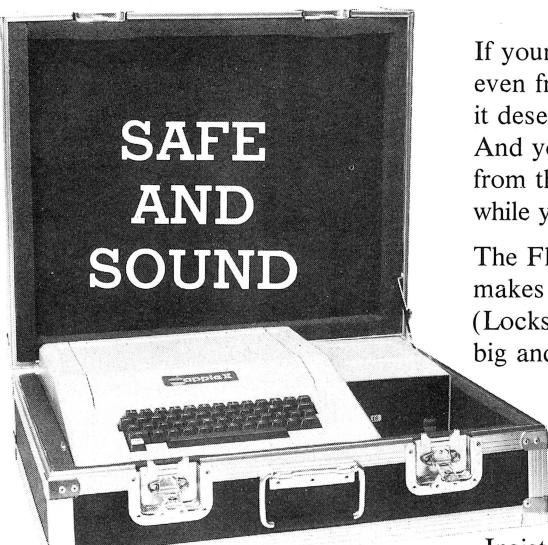
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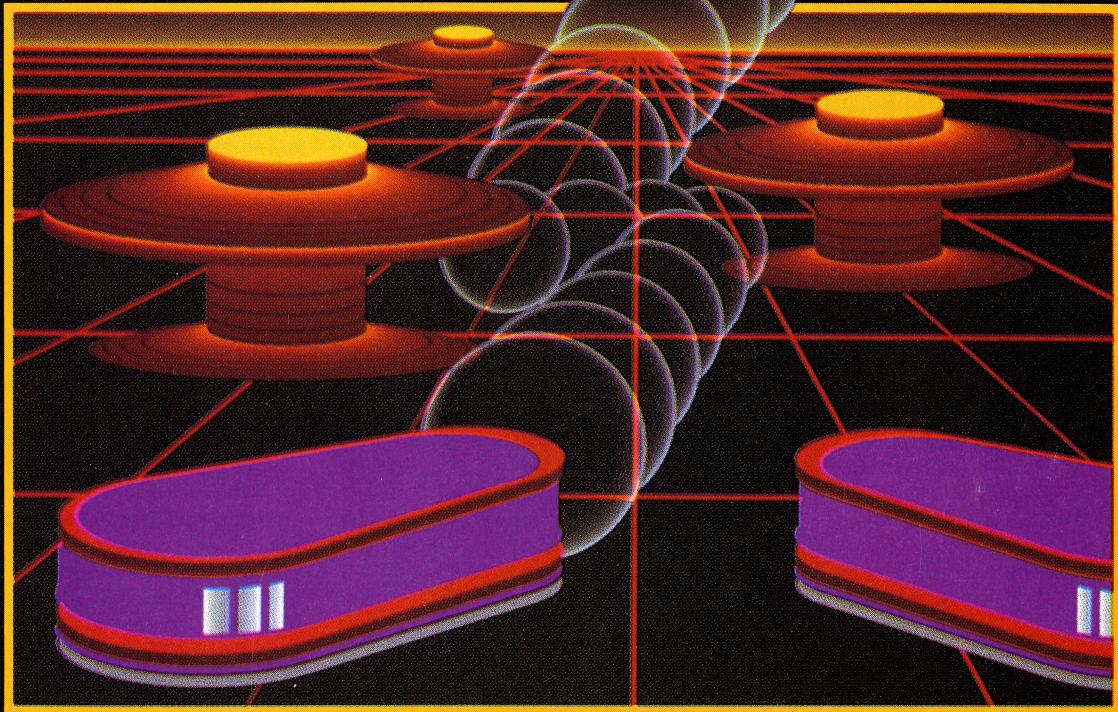
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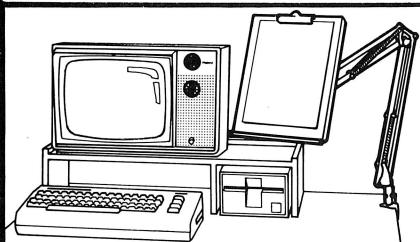
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Circle Help No. 155

Midwest Software  
121 N. Allen Street  
Madison, WI 53705  
(608) 238-4875

courses. Includes a diskette with eight programs, three test files, two demonstration files, user manual. Two of the eight programs are not available for student use; they are used to "foolproof" the remaining six programs and to provide a menu from which these six programs may be selected. These consist of an editor, an assembler, a utility program, and three format-converting programs. In addition to operating information, the manual contains a self-teaching familiarization section, five appendices, and a 10-page cross-referenced index -\$26.50 for teacher and educational use only.

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Custom Micro Systems Ltd.  
16921 108 Street  
Edmonton, Alberta  
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Circle Help No. 165

Thunder Software  
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(713) 728-5501

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Master Computing Inc.  
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Vanguard Systems Corporation  
4226 Center Gate  
San Antonio, TX 78217  
(512) 656-1093

Custom Micro Systems Editor/Assembler (CUMSEA) is an Apple II editor/assembler for teaching 6502 assembly language and for advanced computer literacy

(Microsoft format optional). Features Zilog mnemonics with nested macros, conditionals and include files. Unique one-pass design generates compact intermediate code which is then processed to resolve forward references, yielding tremendous time savings. Complete listing, symbol table and cross-reference output may be sent to any device. The perfect tool for assembly language programming. Linker included. Manual only \$30.00. For Z80 CP/M - \$169.95.

Circle Help No. 163

SLR Systems  
1622 North Main Street  
Butler, PA 16001  
(412) 282-0864

**The Programmer** from Sams is a BASIC code generator which provides a programming "shorthand" to take your ideas and write the appropriate lines of BASIC - so programming is fast and error-free. Through a series of "menus", you can select the direction of function you want the program to perform. Code is generated as you go along. Stop and make changes without destroying your previous work. Comes with a complete instruction book which clearly explains how to create programs for almost any application \$199.95. It works with the Apple II Plus.

Circle Help No. 162

Howard W. Sams & Co., Inc.  
4300 West 62nd Street  
Indianapolis, IN 46206  
(800) 428-3696; (317) 298-5566 (IN)

## Music

**Music Master** interface card (Slot 2 on a 48K Apple type computer) permits the user to create, play and store music. Complete package includes detailed instructions, keyboard coding labels, and two mini stereo speakers with audio cables. With an adaptor (not provided), hook up a stereo amplifier with external speakers. Utilize simple keyboard commands to play preprogrammed music; create custom music; develop new music compositions; add special sound effects (gunshot, explosion, laser cannon fire, whistling aerial bombs, sounds of missiles launching or rockets firing); or designate melody, tempo, chord, beat and rhythm. Works in progress can even be saved on a disk for later completion - \$199.95.

Circle Help No. 161

OPCS, Inc.  
23801 Calabasas Road, Suite 2050  
Calabasas, CA 91302  
(213) 999-5210

**Roland Compu-Music** computer/music synthesizer system allows your computer to write, program, change and store musical compositions of up to eight voices, plus a seven voice electronic drummer. The Compu-Music hardware (CMU-800) is a

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Circle Help No. 160

Roland Corp U.S.  
2401 Saybrook Avenue  
Los Angeles, CA 90040  
(213) 685-5141

## Utilities

**The Datalife Disk Drive Analyzer** is a specially preprogrammed testing disk for

use with Apple II, //e, Apple // series and other disk drives compatible with these systems. In less than two minutes, it automatically analyzes four critical areas of a drive's speed and alignment Handy tool to check out a system.

Circle Help No. 180

Verbatim Corp.

(800) 538-1793; (408) 737-7771 (CA)

**EDX/AB** full screen editor for Applesoft lets you insert, change or delete anywhere on the screen. Not to be confused with Applesoft line editors where each line to be edited must be individually called up. You can scroll through your program in both directions. EDX/AB is controlled by the top row of keys on the keyboard which serve as pseudo-function keys. A graphic symbol for each function is printed on a detachable strip. Written completely in machine language. Requires Apple II with 48K and

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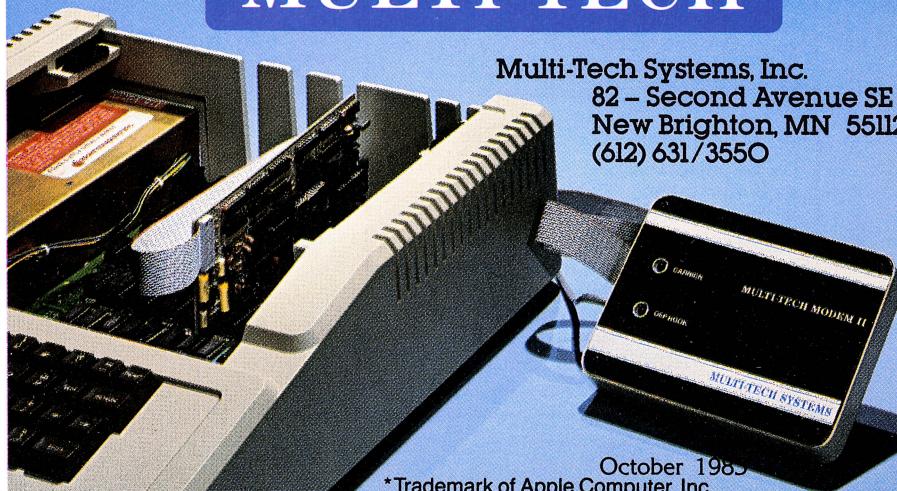
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## MULTI-TECH

Multi-Tech Systems, Inc.  
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New Brighton, MN 55112  
(612) 631/3550



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Circle Help No. 179

Troy Software Design  
63 Roseview Avenue  
Richmond Hill, Ontario  
Canada L4C 1C6  
(416) 884-4527

The **Screen Printer** is an Apple Pascal procedure that will transfer the exact contents of the screen onto any printer. Either the primary or secondary text screen may be printed, or both side-by-side for 80-column display. The Videx VideoTerm 80-column card is also supported. Requires an Apple II Plus with Apple Pascal and any printer - \$25.00.

Circle Help No. 177

SMART Systems, Inc.  
499 Sulky Lane  
Frederick MD 21701  
(301) 694-8307

**Disk Recovery System (D.R.S.)** can actually read information from damaged sectors. Features include the ability to read disks that were recorded off center, or read errors caused by hub damage. D.R.S. will type, grade and fix all possible files and make recovered files accessible for conventional editing. All of this is totally automatic. \$100.00.

Circle Help No. 176

Sof-Sys, Inc.  
4306 Upton Avenue South  
Minneapolis, MN 55410  
(612) 929-7104

**Confidential Information Advisors** is a collection of five sophisticated disk utilities: Tricky Dick examines, records, deletes, and edits individual sectors on normal and most protected disks. The Linguist reads in a trackful of raw data, translates all the address information, and allows you to inspect the track's formatting. The Tracer rapidly searches normal and most protected disks for up to six strings simultaneously (specified in ASCII or hex). It also verifies disk formatting, and sniffs out all hidden catalog or VTOC sectors. The Code Breaker keeps programs and text files from prying eyes by encryption during disk storage. The Tracker closely shadows the disk drive arm, carefully recording all its movements and operations. Use it to locate the precise trouble spots on a clobbered disk, to determine sector skew patterns, to discover the location of hidden "nibble-count" tracks on protected disks. The CIA Files is a 50,000-word book designed to turn you into a disk expert. Contains a hand-holding tutorial on all aspects of the Apple disks. All programs are unprotected. Requires an Apple with 48K and DOS 3.3.

Circle Help No. 175

Golden-Delicious Software Ltd.

350 Fifth Avenue, Suite 3308  
New York, NY 10118

**MicroShell** gives new power for CP/M systems. Features include: elimination of the warm start at disk changes; finds files automatically by searching through all disks, or selected disks, even when a program calls for a file. Run WordStar, for instance, from any disk or user number and MicroShell finds the necessary WordStar files; enter a string of CP/M commands on one line; edit the last command line; redirect output to a file; type a file with screen control; etc. Sets up menus to make your system friendly. Many more sophisticated features for advanced programming - \$150.00, Manual only \$25.00.

Circle Help No. 173

New Generation Systems, Inc.  
2153 Golf Course Drive  
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**Smartkey** is a unique utility that can redefine any ASCII character or function key to become anything you want. For example, "#" can become "pip b:=a.\*.pas[v]". With a single stroke, a key can represent a chosen character or string at the system level or within a program without rewiring or soldering. Completely user-transparent, resides on the top of memory and intercepts calls to the BIOS, translating system input to whatever you desire. Change a key definition while another program such as WordStar is in operation, without interrupting it. For programming, data entry or word processing \$60.00.

Circle Help No. 172

Heritage Software, Inc.  
2130 S. Vermont Avenue  
Los Angeles, CA 90007  
(213) 737-7252

**Master Key+** allows you to move protected programs to a hard disk system or a standard Apple formatted disk. Master Key+ lets you stop, list, change or modify most programs, search through memory, display memory in HEX/ASCII, disassemble ranges of memory, step through machine language programs one instruction at a time and display them in HEX, ASCII, or Binary. Requires a 48K Apple II or Apple II Plus with any 16K expansion card and one disk drive \$49.00.

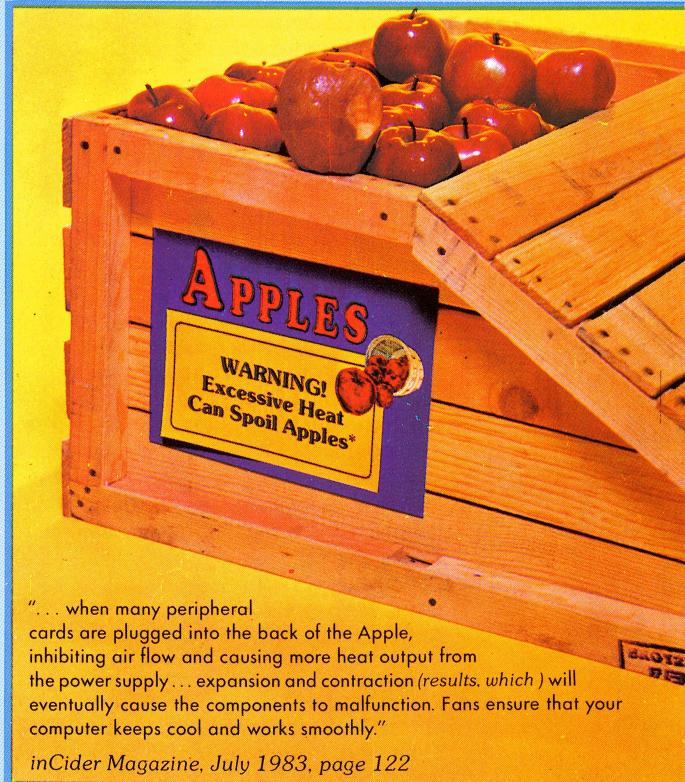
Circle Help No. 171

Cider Systems Software  
1716 E Street  
Lincoln, NE 68508  
(402) 473-2866

## Word Processing

**Write Away** is an advanced, full function word processing system for the Apple //e. Programs will also work on an Apple II with 48K of memory. Includes a mail-merge-form letter feature capable of handling conditional text, and utilities to create mailing lists from popular data bases for use

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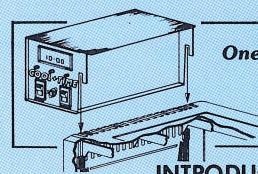
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with the mail-merge feature. Creates ordinary Apple DOS text files, with fast load into the 28K buffer. Documentation includes both on-screen and written tutorials. 64K systems can take advantage of the instant switching from edit to print programs and back. Recognizes all 80-column boards without need for separate configuration - \$175.00

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(301) 659-7212

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grams. Cross-converts files created by: AppleWriter, Screenwriter II, Letter Perfect 5.02, DataPlot, Applesoft TEXT, SuperScribe, Word Handler, SuperText, Magic Window, Apple PIE, VisiCalc, etc. Transfer DataPlot picture files to standard Apple DOS disks so that you can use them within your own programs, or print them with any graphics printer. You may also convert Applesoft programs into text files, which can then be edited, printed or transmitted \$39.95.

Circle Help No. 168  
Micro-sparc, Inc.  
P.O. Box 639  
Lincoln, MA 01773

**54 VisiCalc Models: Finance-Statistics-Mathematics** by Robert H. Flast is a large collection of ready-to-run VisiCalc programs to solve common business, math, and statistics problems. Flast gives ready-made solutions to a variety of applications demonstrating the full range of this software's capabilities. All 54 programs are fully documented, tested and debugged. Users can either enter their own data directly into the models provided or refer to them for guidance while developing their own applications. 277 pages \$15.95.

Circle Help No. 187  
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Berkeley, CA 94710  
(415) 548-2805

## BOOKS/CATALOGS

**The VisiCalc Program Made Easy** by David M. Castlewitz is a step-by-step VisiCalc tutorial. By following the numerous exercises and examples in the book, even first-time VisiCalc users will be able to achieve professional results. The first part introduces the basic skills needed to build a worksheet. The second part examines the commands that are used to change and edit a worksheet. The third section covers advanced uses and special tricks that extend the capabilities of the VisiCalc programs.

200 pages - \$12.95.  
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**Apple II Computer Graphics** offers a complete explanation of Apple II and //e graphics techniques - from placing dots on the screen to artificial color generation, animation, and even sophisticated byte-move techniques. You'll also get the "inside" on other Apple //e graphics features, including techniques for programming and designing many of today's popular computer games; a complete section on business and technical graphics; examples in assemble language for advanced users; stimulating end-of-chapter exercises 1983, 150 pages, paperback - \$19.95.

Circle Help No. 186  
Robert J. Brady Co.  
Bowie, MD 20715  
(301) 262-6300

**Game Techniques in Applesoft BASIC** by Peter and Rosemarie Gabriele. It shows how to program animated games in logical and easy-to-understand language. It is designed for those who are tired of just playing computer games and who want to be more creative. Also available: **How to Select and Buy a Personal Computer** by Ursula Connor, written by an expert with over 15 years of experience. Is said to cut through the maze of technology and lead the small businessman directly to a solution for his specific problems.

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Devin-Adair Publishers  
143 Sound Beach Avenue  
Old Greenwich, CT 06870  
(203) 637-4531

**Power Master Line Monitor Power Conditioner Catalog** features seven new electrical spike suppression and electronic noise suppression products for two and three wire applications. For 15 or 20 Amp, 125 or 220 Volt applications. Models are available in plug-in, multi-outlet strip, rack or panel mount, console and hard-wire configurations. These units protect solid state electronic equipment from voltage spikes and noise interference which can cause information loss, equipment malfunction and premature circuit failure. 24 pages.

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**Introduction to CP/M Assembly Language** is a step-by-step manual on simple CP/M programs that work. 180 pages present various ways of inputting and outputting data to a terminal, and feeding a line printer. The I/O methods used are based on CP/M function constructions, thus are interchangeable with "standard" CP/M systems. Only minimal prior exposure to Assembly language is required. Two useful programs are constructed to demonstrate CP/M techniques: Single-drive copy and Data base program. Also includes a simple program demonstrating game programming techniques and a short section on program troubleshooting - \$15.95.

*Circle Help No. 182*  
Executive Computer  
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*Circle Help No. 199*  
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*Circle Help No. 197*  
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1530 E. Birchwood  
Des Plaines, IL 60018  
(312) 827-6661



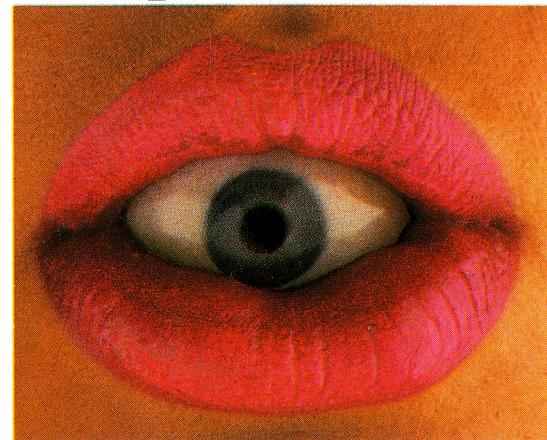
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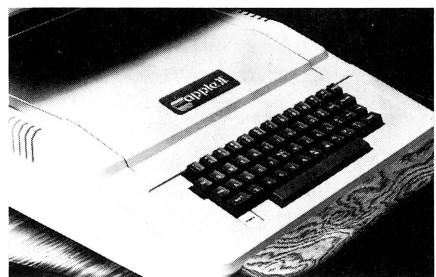
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Canton, MA 02021  
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The **Applerest** is available in two models, ABS plastic or oak. Plastic model allows you to place a quick reference template into the palm rest or exchange the template with the padded Applerest insert available in black, brown, blue or gray. They can also ship custom ordered leather pads or a personalized Applerest with your name. Includes a clear acrylic cover. ABS Model AR101 - \$19.95. Hand finished solid oak palm rest, Model 201, with brass hardware - \$29.95.

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Applause  
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*Circle Help No. 195*  
Apple Gift Catalog  
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Cupertino, CA 95014  
(800) 227-6703; (800) 632-7979 (CA)

The **Under-Stand** monitor stand, constructed of ultra-strong 3/8 inch clear acrylic, has less flex and allows for better convective cooling than other stands. Can be easily modified by the maker to accept an Apple attached cooling fan. Holds one or two drives, plus paddles or joystick on the center shelf, with the strength to hold a weighty monitor on top. The Apple can be easily slid out from underneath for easy access to peripheral cards - \$71.95.

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*Circle Help No. 192*  
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*Circle Help No. 191*  
FineTech Furniture, Inc.  
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(615) 765-5021

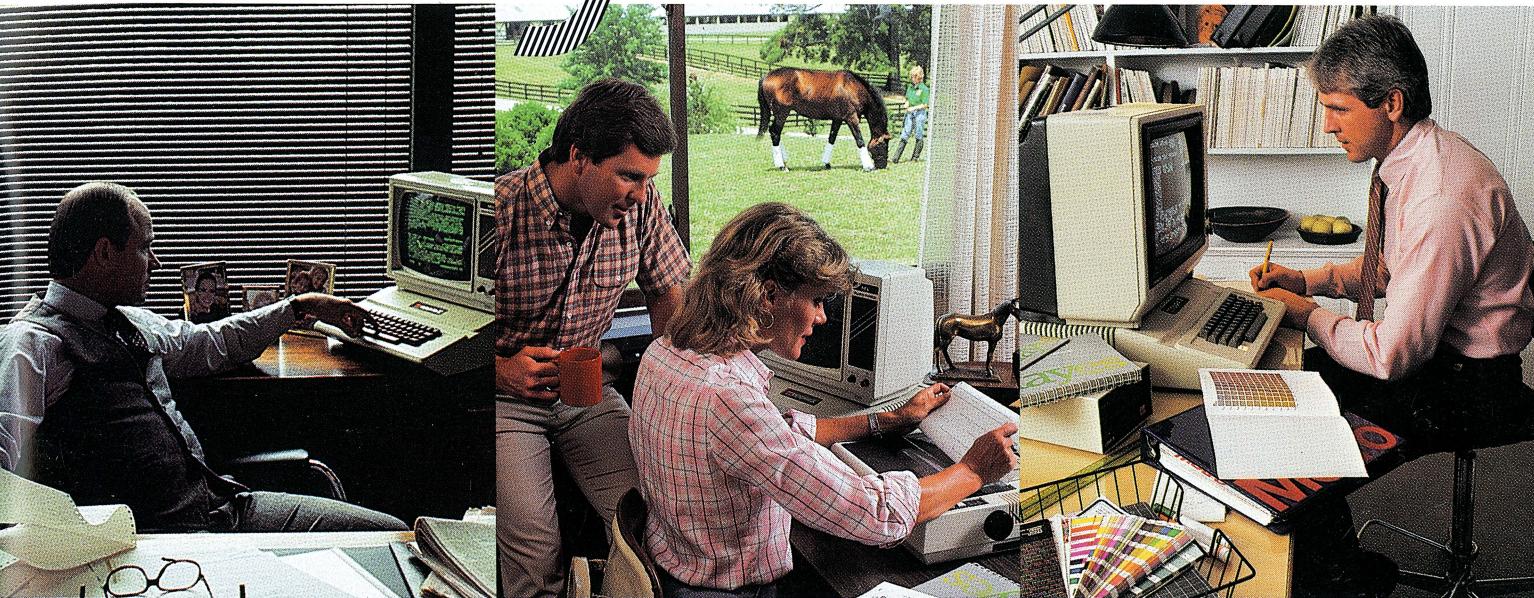
The **Standard** solves the paper pile problem. If you own a printer you recognize the problem: where to store the paper so it can properly feed into the printer. The Standard stores hundreds of sheets in an attractive dispenser directly under the printer. Paper is fed properly, is protected from dirt and dust, and space is saved. Two models: Small, for Epson MX- and FX-80, C. Itoh Prowriter, Apple and IBM Dot Matrix and other similar printers - \$49.95. Large, for wider carriage printers such as the Epson MX-100 - \$64.95.

*Circle Help No. 190*  
Kensington Microware  
919 Third Avenue  
New York, NY 10022  
(212) 486-7707

Your Apple is an expensive investment worth protecting from dust and debris. **Qwk** is that protection. It is a professional keyboard cover made of high impact, textured black plastic. The Qwk keyboard cover holds itself snug in place on padded arms, requiring no attachments to the Apple chassis. It is quickly removed \$12.95.

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P.O. Box 1413  
Tacoma, WA 98401

# It's Your Apple's telephone. Hayes



"Thanks for the prompt reply. Sure was a lot faster than waiting for the mail!"

"Gary: The pedigrees for next week's auction are as follows..."

"Attn. Prod., Sales, Purch.: Recommend 50% blue, 30% red screen for closest match."

**A complete plug-in communications system for Apple® computers.** From Hayes, the established telecomputing leader: the simple but sophisticated Micromodem IIe™ plug-in board modem and its companion software, Smartcom I.™ Everything you need to expand the world of your Apple II, IIe, II Plus and Apple III. In one, convenient communications package.

With Micromodem IIe and Smartcom I, you can access data bases, bulletin boards, and the varied resources of information services. Plan your travel itinerary via computer, including flight numbers, hotel and rental car reservations. Retrieve and analyze daily stock and options prices. Work at home and send reports to your office. You can even do your gift shopping by computer!

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Micromodem IIe dials, answers and disconnects calls automatically. And, unlike some modems, it operates in full or half duplex, for compatibility with most time-sharing systems.

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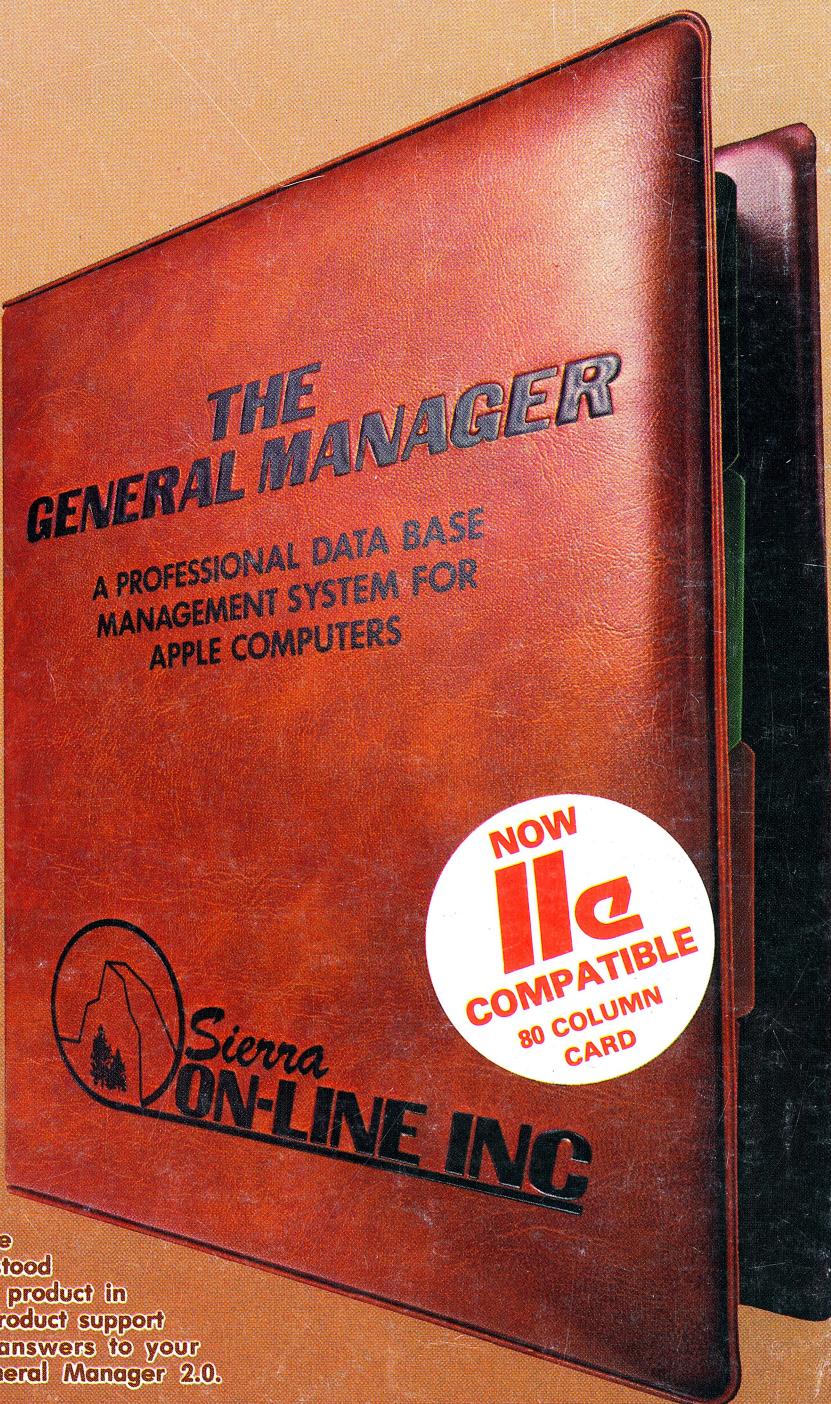
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